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THE NEW YORKER

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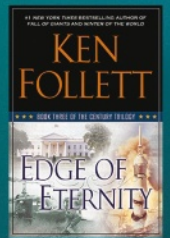
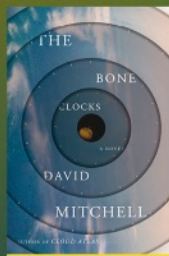


the victories
that fill us with
triumph

the magic
that inspires us to
dream

the tenderness
that lets us
melt

the journeys
that lead us to
escape



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jennifer lawrence

OSCAR WINNER, FRANCHISE
STAR, *PRIVACY CRUSADER*,
BREATH OF FRESH AIR

"I don't like yes-people.
I don't like lackeys. I don't
like people when they
fake-laugh at my jokes."

INTERVIEW: SAM KASHNER
PHOTOGRAPH: PATRICK DEMARCHELIER
VANITY FAIR

pharrell williams

RENOWNED WRITER-PRODUCER-
PERFORMER-COLLABORATOR, VOICE
COACH, "HAPPY" HITMAKER.
AMERICA'S MOST POPULAR MUSIC MAN

"When I was young, I thought
I knew *everything*. Now, I'm not
sure if I know *anything*."

INTERVIEW: LYNN HIRSCHBERG, W MAGAZINE
PHOTOGRAPH: PAOLA KUDACKI, GQ



lena dunham

MOTHER OF GIRLS,
EMPOWERER OF EVERYWOMAN,
EXPLICATOR OF THE ZEITGEIST

"I still go to a party and say something embarrassing to someone, and then write them a weird e-mail about it the next day, and then write them a text because I think they didn't get the e-mail. No matter what happens with your level of success, you still have to deal with all the baggage that is yourself."

INTERVIEW: NATHAN HELLER
PHOTOGRAPH: ANNIE LEIBOVITZ
VOGUE





channing tatum

AS *FOXCATCHER*'S OLYMPIAN, HE
WRESTLES THOSE BRO-HIMBO-G.I. JOE
ROLES TO THE MAT

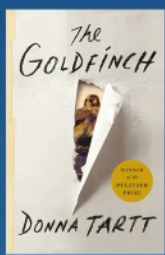
"What I respect about this entire business is the hustle of it all and how many people have carved out their purposes in it. Somehow I carved out a place for myself."

INTERVIEW: CHRIS HEATH
PHOTOGRAPH: SEBASTIAN KIM
GQ

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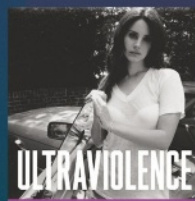
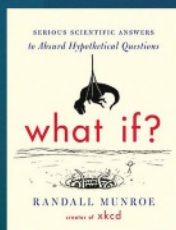
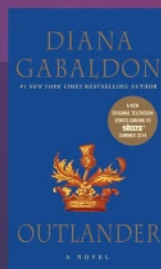


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that trigger a
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that ignite our
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the darkness
that makes us
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PHILIP LEVINE

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POEMS

"Study with Melon"
"By the Waters of the Llobregat"

RICHARD MCGUIRE

COVER

"Time Warp"

DRAWINGS Paul Noth, Zachary Kanin, Barbara Smaller, David Sipress, Robert Leighton, Drew Dernavich, Jack Ziegler, Danny Shanahan, Joe Dator, Bob Eckstein, P. C. Vey, Frank Cotham, Roz Chast, Michael Crawford, Charlie Hankin, William Haefeli, John Klossner, Mick Stevens, Matthew Diffie, Emily Flake, Michael Shaw, Liam Francis Walsh **SPOTS** Leandro Castelao



"Hold on, I'm going to conference in my wrist."

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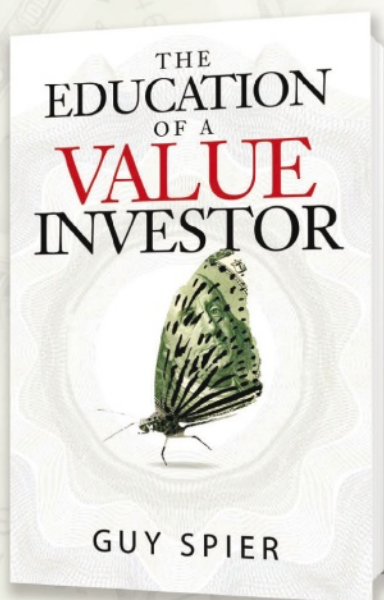


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RICHARD McGUIRE (COVER) is an illustrator and comic artist, and a musician. His work is included in the MOMA exhibit "Making Music Modern: Design for Ear and Eye," which just opened. His book "Here" comes out in December.

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VIDEO: A day in the life of a flamenco guitarist living in Seville, Spain.

FICTION AND POETRY: Readings by Brad Watson and Philip Levine.

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A NOTE TO OUR READERS

In late July, we launched the redesigned newyorker.com and wrote a letter to you, announcing that for the rest of the summer and into the fall we would unlock everything we published—everything in the weekly magazine and the fifteen-some pieces that appear exclusively online every day—so that everyone, including non-subscribers, could get a full sense of *The New Yorker*.

Naturally, we were hoping that the exhibitionism of July-till-now would be an enticement. We said then that we would soon come to a “second phase,” and here it is: we have started an easy-to-use metered paywall. You probably know how this works; the New York Times has a metered paywall, and so do many other publications. The idea is to deliver *The New Yorker* to you seamlessly on every platform and to charge a fair price for it. (One week’s access to *The New Yorker* costs a subscriber less than a good cup of coffee.)

The truth is that, ever since *The New Yorker* went online, we’ve always had a paywall. (Remember those bewildering little blue locks?) Now all pieces—Web and print—will live in front of it, and you can start wherever you wish. If you already subscribe, you can read everything. If you have a log-in, click “Sign in”; if you subscribe and don’t have a log-in, click “Link your subscription,” follow the simple steps, and it’s clear sailing. If you don’t subscribe, you get to read six stories each calendar month—from the current issue, from an issue published five years ago, or from a blog updated ten minutes ago. If you want to make the “wall” go away and read a seventh, you’ll have to subscribe.

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access to everything, and we will do all that we can to help you get there. If you’re not a subscriber, we hope you’ll become one now.

—*The Editors*

THE ABORTION FIGHT

All of us who provide abortions are very familiar with women like Marjorie Dannenfelser, who, as Kelefa Sanneh writes, work to restrict and ultimately ban legal abortion in the United States (“The Intensity Gap,” October 27th). Nevertheless, when women who have proclaimed themselves to be anti-abortion are faced with a pregnancy that they cannot handle, for either fetal or maternal reasons, they come to doctors like me for safe and legal abortions—and yes, sometimes even after twenty weeks. Despite our political differences, I treat these women with kindness and compassion. I hope that Dannenfelser’s campaign to ban abortion is not successful. One in three women in the United States will have an abortion at some point in their lives. Despite restrictions and bans, women will continue to seek to terminate pregnancies. I fear for their health, safety, and well-being.

Shelley Sella, M.D.
Albuquerque, N.M.

Dannenfelser believes that the “rewarding process” of raising her cognitively disabled daughter convinced her that “every pregnancy, even the most difficult, should be a source of joy,” according to Sanneh’s article. She appears to live in a privileged environment, with access to health insurance and plenty of resources to care for her daughter. The same cannot be said of every woman who seeks an abortion. So my question to Dannenfelser is: Would you continue to organize financial support for staunchly pro-life politicians who would ban abortion only if they agreed to fund the full cost of raising a child born to a crack-addicted nineteen-year-old, or a woman with health problems who cannot afford the cost of a disabled child, or

an abused woman who is already raising five children and works two jobs? Would a G.O.P. candidate support early-childhood education, college tuition, and full health care for that child until the age of eighteen? I am reminded of George Carlin’s joke that “Pro-life conservatives are obsessed with the fetus from conception to nine months. After that, they don’t want to know about you.” Kid, you’re on your own. “If you’re pre-born, you’re fine; if you’re preschool, you’re fucked.”

Melanie Magruder
North Hollywood, Calif.

Having been raised a conservative Catholic by parents who were active in the anti-abortion movement, I find strange parallels between my life and Dannenfelser’s, but in reverse. In my youth, I tepidly participated in my family’s anti-abortion activism. Now I lie awake at night worrying about the loss of abortion rights. I am a midwife and family nurse practitioner, and I serve on the advisory board of the Abortion Rights Freedom Ride. I also founded Personhood for Women. Dannenfelser and her ilk, with their dynamic fetus-focussed campaigns, conveniently ignore the human rights of the people in whom these fetuses reside. The pertinent question is not when does a fetus become a human being but at what point does a woman cease to be a human being and become a state-regulated incubator? Instead of debating the “personhood” of embryos and fetuses, why aren’t we asking whether the government has a right to force female citizens to be life-support systems for other “persons,” against their will? As anti-abortion politicians continue to pursue legal-personhood status for fertilized eggs, embryos, and fetuses, and succeed in getting clinics closed, the words of Susan B. Anthony resonate uncomfortably: “The only question left to be settled now is: Are women persons?”

Mary Lou Singleton
Albuquerque, N.M.

•
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GOINGS ON ABOUT TOWN



NOVEMBER 2014 WEDNESDAY 19TH THURSDAY 20TH FRIDAY 21ST SATURDAY 22ND SUNDAY 23RD MONDAY 24TH TUESDAY 25TH

WHEN THE NEW YORK BAND Interpol released its debut album, "Turn On the Bright Lights," in 2002, it was a shining moment for rock acts in the city. Although the spotlight has moved on, Interpol has endured, delivering post-punk bricolages of moody melodies and brainy lyrics. In 2010, Carlos Dengler, a.k.a. Carlos D., Interpol's eccentric bass player, quit the band, but the other members of Interpol—the lead singer, Paul Banks, the guitarist, Daniel Kessler, and the drummer, Sam Fogarino—regrouped, with Banks taking over the foundational bass-playing duties. Their new album, "El Pintor," is full of high-energy anthems with familiar streaks of misery. Interpol is on a North American tour that finds them at Terminal 5 on Nov. 24-26.

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"HOW MUCH
FOR JUST
THE DRIVEWAY?"

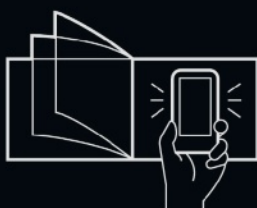
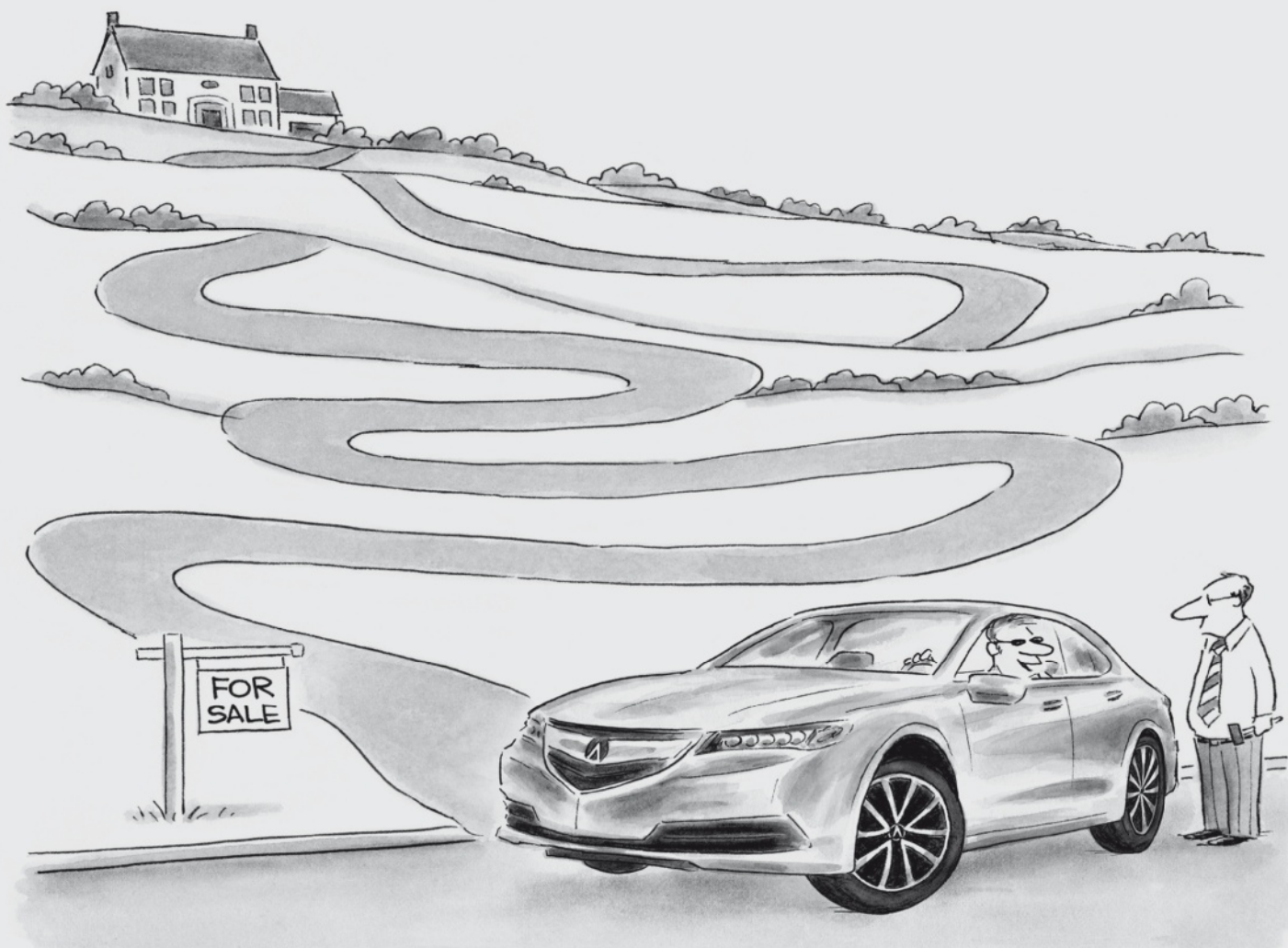
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TLX IT'S THAT KIND OF THRILL



Sturtevant posed with Robert Rauschenberg for her 1967 piece "Duchamp Relâche," now at MOMA.

AFTER IMAGE

The American artist Elaine Sturtevant made her name reprising others' work.

"STURTEVANT: DOUBLE TROUBLE," AT MOMA, celebrates perhaps the oddest American artist of the last half century. Elaine Sturtevant, who died this year at the age of eighty-nine, in Paris, where she had lived since the early nineties, made a low-profile, pesky career of copying works by others, mostly men: Marcel Duchamp, a specialty, but also Jasper Johns, most of the leading Pop artists, Joseph Beuys, and, eventually, Keith Haring, Paul McCarthy, and Robert Gober. She grew up in Cleveland and earned two degrees in psychology before turning to art and settling in New York, in the fifties. One work in the show—a sparse but visceral abstraction made with cut-open paint tubes, from 1961—hints at real promise before Sturtevant, starting in 1964, submerged in her campaign of "repetitions," as she termed her copies.

She was a kinky presence on the scene. She got her friend Robert Rauschenberg to pose in the nude with her, as Adam and Eve, for a photograph replicating one that had featured Duchamp in 1924. Cordially, Andy Warhol gave her a flower silk screen and Roy Lichtenstein a dot stencil to help her feign them; Claes Oldenburg, though, was unamused when, in 1967, she remade his 1961 "Store" installation. Most of the aped artists, and nearly every critic, ignored her. A bit more welcome in Europe, she was among the first Americans to appreciate Beuys, miming his smoky charisma with videos in 1971.

ART

Sturtevant fashioned video works on her own steam late in life. The most fetching spans a long wall with a tracking shot of a dog running. As installed by the show's curator, Peter Eleey, the pooch seems aimed at a faux Johns "Target" painting. Theatrical throughout, the show's presentation is a curatorial tour de force. That's lucky, because the works would be hard put to sustain interest otherwise.

As a painter, Sturtevant was facile but not up to persuasive forgery, had that been her goal. She had a tin eye for color. The discouraging red and citron of her silk-screened Warhol "Cow" wallpaper highlight, by contrast, the wondrous harmony of Andy's original pink and chartreuse. But she was impressively acute in singling out the best of her contemporaries. Her career amounted to an exercise in hands-on art criticism—a one-person age of manual reproduction—informed by emerging intellectual trends. The show's wall texts duly cite issues of authorship, appropriation, and so on, counting the beads of the postmodernist rosary.

Was Sturtevant prophetic? Not really, unless you imagine that the likes of Warhol and Beuys were unaware of their own works' philosophical implications. But no one at the time was a faster study. "I create vertigo," she boasted. And that she does, in a force field between giddy thought and desultory matter. You will likely be glad to have spent twenty or so minutes in Sturtevant's company. If you stay longer, it will be to enjoy cogitating along lines that academic criticism since the sixties has carved into frictionless grooves.

—Peter Schjeldahl

GLENSTONE. PHOTO: CHARLES DUPRAT (FROM AN EARLIER VERSION BY DAVID HAYES). © ESTATE STURTEVANT, PARIS

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MUSEUMS SHORT LIST METROPOLITAN MUSEUM

"Assyria to Iberia at the Dawn of the Classical Age." Through Jan. 4.

MUSEUM OF MODERN ART

"Sturtevant: Double Trouble." Through Feb. 22.

MOMA PS1

"Xavier Le Roy." Through Dec. 1.

GUGGENHEIM MUSEUM

"Zero: Countdown to Tomorrow, 1950s–60s." Through Jan. 7.

BROOKLYN MUSEUM

"Crossing Brooklyn: Art from Bushwick, Bed-Stuy, and Beyond." Through Jan. 4.

AMERICAN MUSEUM OF NATURAL HISTORY

"Nature's Fury: The Science of Natural Disasters." Through Aug. 9.

ASIA SOCIETY

"Nam June Paik: Becoming Robot." Through Jan. 4.

FRICK COLLECTION

"Masterpieces from the Scottish National Gallery." Through Feb. 1.

NEW MUSEUM

"Chris Ofili: Night and Day." Through Feb. 1.

NEW-YORK HISTORICAL SOCIETY

"Annie Leibovitz: Pilgrimage." Opens Nov. 21.

SCULPTURECENTER

"Puddle, Pothole, Portal." Through Jan. 5.

STUDIO MUSEUM IN HARLEM

"Speaking of People: Ebony, Jet and Contemporary Art." Through March 8.

GALLERIES SHORT LIST

CHELSEA

Martin Puryear
Marks

502 and 522 W. 22nd St.
212-243-0200.
Through Dec. 20.

Kara Walker

Sikkema Jenkins
530 W. 22nd St. 212-929-2262.
Opens Nov. 21.

Lynette Yiadom-Boakye

Shainman
513 W. 20th St and 525 W. 24th
St. 212-645-1701.
Opens Nov. 21.

DOWNTOWN

Greer Lankton

Participant
253 E. Houston St.
212-254-4334.
Through Dec. 21.

Noam Rappaport

Fuentes
55 Delancey St. 212-577-1201.
Through Dec. 21.

"The Contract"

Essex Street
114 Eldridge St. 917-263-1001.
Opens Nov. 21.

MUSEUMS AND LIBRARIES

Metropolitan Museum

"Bartholomeus Spranger:
Splendor and Eroticism in
Imperial Prague"

For a few decades before the notorious defenestration that helped provoke the Thirty Years' War, Prague was the capital of the Holy Roman Empire, where the aesthete sovereign Rudolf II hired a Flemish court painter with a graceful hand and a dirty mind. Spranger, after a youthful religious phase in Italy, came north in the late sixteenth century, and in Prague he created lithe allegories, typically starring resilient women and overpowered men. This revelatory show places Spranger's paintings and drawings in their rightful place as forerunners of Rubens and Van Dyck, thanks in part to subsequent engravings by the master Hendrik Goltzius. More than that, it puts Bohemia back on the map of European art history, most winningly through a re-creation of Rudolf's unrivalled cabinet of curiosities, featuring bird skeletons, musical instruments, and Spranger's "Jupiter and Antiope," a Mannerist banger done around 1596. The youthful god, in the form of a satyr, wraps his arm around the nymph's breast, but the disguise doesn't fool his ardent lover. With one dainty hand she points shrewdly to an eagle, Jupiter's emblem, while with the other she strokes the fur of his goat crotch. Through Feb. 1.

Jewish Museum

"Helena Rubinstein:
Beauty Is Power"

This campy tribute opens just as its subject would have wanted: with a velvet curtain behind a gauzy, spotlight portrait of the First Lady of cold creams, clad in pearls and a gold sash and looking very, very young for her age. The Polish-born Rubinstein—or "Madame," as the wall text purrs—was a bona-fide entrepreneur, making her name first in Australia before setting up a global empire as (per a 1915 *Vogue* ad) "the accepted adviser in beauty matters to the Royalty, Aristocracy and the great Artistes of Europe." Yet despite her large collection of African and pre-Columbian sculpture Rubinstein never aspired to be a connoisseur. She owned a nice early study for "Les Demoiselles d'Avignon" but also cherished a dozen frightful sketches Picasso made of her when she showed up, unannounced, on his Riviera doorstep. The inclusion of some personal effects—the jewelry! the Balenciaga gown!—may invite mockery, but Rubinstein doesn't need our approval. As she told one

sniffy critic, "Quality's nice, but quantity makes a show." Through March 22.

GALLERIES—UPTOWN

Will Brown

The Philadelphia photographer makes his New York gallery debut at seventy-seven with a richly atmospheric group of black-and-white streetscapes from the mid-nineteen-seventies. Working early in the morning in a neighborhood that had seen better days, Brown focussed on shop signs, commercial façades, and dusty windows that look like velvet in the soft light. A group of children pose before an open hydrant, and three men watch from their spots on the sidewalk, but most of these sites are unpopulated, and many seem abandoned, giving the work a lovely memorial quality, with echoes of both Eugène Atget and Walker Evans. Through Dec. 20. (Laurence Miller, 20 W. 57th St. 212-397-3930.)

"Something Beautiful"

Sue de Beer's moody photographs of twentysomethings bathed in tinted light set the stage for this meditation on classic themes of youth and beauty. Smaller pieces can look a bit lost in this town-house gallery's high-ceilinged rooms, lending the show a sense of isolation, alienation, and drift. Subjects close their eyes or turn away from the camera in pictures by Jeff Burton, Dorothee Smith, and Viviane Sassen. In works by Annika Larsson, Eva Stenram, and Eric Stephany, figures appear fragmented and ephemeral: a bare leg, a clenched palm, a shadow. Keith Edmier's gorgeously surreal flower sculptures, including a funeral wreath, add an appropriately elegiac note. Through Dec. 20. (Boesky, 118 E. 64th St. 212-680-9889.)

GALLERIES—CHELSEA

Melvin Edwards

The veteran American sculptor, known for welding metal objects into percussive, politically freighted combinations, presents old and new work engaged with the history of Africa, in some cases made in his studio in Dakar. More than a dozen sinister bundles of locks, chain links, horseshoes, and grappling hooks are affixed to the walls; a few newer works, made in association with Senegalese metalworkers, incorporate wrought-iron grilles that evoke storm drains and prison windows. The largest work, dated 1978–81, is an homage to Léon-Gontran Damas, the French poet and co-founder of the *négritude* movement, whom Edwards met early in his career in New York.

A chain, two disks, a freestanding crescent panel: these stern forms become, through Edwards's assembly, not just a memorial but a call for justice. Through Dec. 13. (Gray, 508 W. 26th St. 212-399-2636.)

Bryan Graf

The inventive photographer, who works in Maine, has dispensed with the camera in his beautiful new pictures, which were made using colored gels, mesh netting, and light. Graf's photograms feel in-process, as if the fabric were still moving, refracting and layering gossamer passages of magenta, rose, and acid green. Walead Beshty has made similarly color-rich abstractions at this scale (the largest piece here is just over six feet high), but Graf's materials give his work more texture and an exhilarating buoyancy. Through Dec. 6. (Richardson, 525 W. 22nd St. 646-230-9610.)

Judith Lauand

A key figure of the Brazilian concretist movement, now ninety-two, is the subject of this overdue retrospective. Abstract compositions of the late fifties, featuring skewed red and white stripes or arrays of spindly lines, embody the optimism of President Kubitschek's modernizing nation; by the sixties, under a censorious dictatorship, the artist had turned to monochromes studded with paper clips and Pop tableaux incorporating sly Portuguese wordplay. (One image of an embracing couple is emblazoned with letters that can be read as *amor* or *a morte*.) An electric collision of orange and blue chevrons from 2007 is one of several later works that testify to Lauand's ongoing prowess. Through Dec. 20. (Driscoll Babcock, 525 W. 25th St. 212-767-1852.)

GALLERIES—DOWNTOWN

Amy O'Neill

The video at the heart of this jumbled show about America's romance with the open road—specifically with the culture of long-haul eighteen-wheelers—juxtaposes footage of a marooned riverboat with more surreal footage of truck cabs floating in space, all backed by an incongruous sitar soundtrack. Also on hand are colored rabbits' feet, a hood crowned with a soaring bird ornament, and a chrome gearshift that looks as fetishistic as it does automotive. O'Neill is a bit too carefree with her range of mediums—crypto-Pettibon cartoons of a rig and a pinup are missteps—but the gaze that she casts on the machismo subculture is keen and never so critical that it loses its empathy. Through Dec. 6. (Karma, 39 Great Jones St. 917-675-7508.)

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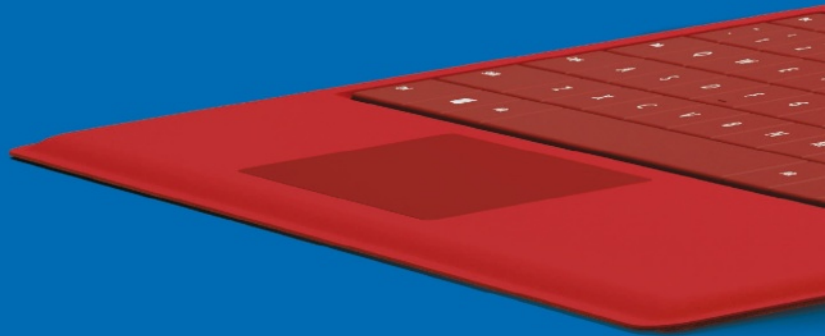
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Carnegie Hall showcases the music of Meredith Monk in a series of concerts that begin this week.

DOWNTOWN SHAMAN

Meredith Monk maps a new world of sound.

WHEN THE COMPOSER MEREDITH MONK began her career in New York, fifty years ago, you could rent a decent apartment in Manhattan for a hundred dollars a month, perhaps for much less if you were willing to venture into one of the scruffier parts of downtown. Monk has lived in a loft space in Tribeca since the early seventies; while the neighborhood has become a fortress of wealth, she has kept alive the dream of a bohemian metropolis, a place in which artists could afford to abandon convention and experiment at will. Drawing variously on choreography, filmmaking, and theatre, Monk has mapped a world that never quite existed in the history of the arts. At once visceral and ethereal, raw and rapt, her works banish the spurious complexities of urban life and reveal a kind of underground civilization, one that sings, dances, and meditates on timeless forces.

Monk now occupies the Richard and Barbara Debs Composer's Chair at Carnegie Hall, a post previously held by such eminences as Pierre Boulez, Elliott Carter, and John Adams. A season-long series of performances hosted by Carnegie, including an event at Le Poisson Rouge on Nov. 20 (with the pianists Ursula Oppens and Bruce Brubaker) and an American Composers Orchestra concert at Zankel Hall on Nov. 21, will show the degree to which composition has dominated Monk's later period: she has long displayed a refined ear for instrumental sound, but in recent years she has written several gently formidable pieces for orchestra and infused her theatre pieces with a sophisticated interplay of strings, wind, and percussion. Her symphonic sensibility makes itself felt in "On Behalf of Nature," a kind of wordless ecological oratorio that BAM will present in early December. The work takes inspiration from the poet Gary Snyder, who has exhorted artists to speak for "non-human entities communicating to the human realm through dance and song." Monk might have been born to play that shamanistic role.

—Alex Ross



CLASSICAL MUSIC

OPERA

Metropolitan Opera

Graham Vick's production of Shostakovich's "tragedy-satire," *"Lady Macbeth of Mtsensk,"* is big on satire and short on tragedy—until the close, when the leading character, Katerina (a hearty and convincing Eva-Maria Westbroek), on her way to prison for murder, emerges out of her haze of erotic bafflement by way of a pure, spine-tingling scream. James Conlon, who conducted the staging when it debuted, in 1994, paces the opera masterfully but, like Vick, rarely seeks out feeling; still, the orchestra and chorus tear lustily into the composer's always exciting score. Brandon Jovanovich and Raymond Very are solid in the roles of Katerina's opportunistic lover and her useless husband, but it's the first-rate crew of Slavic singers—especially the distinguished Ukrainian bass Anatoli Kotscherga, as Boris, the lecherous father-in-law—who hint at realms otherwise ignored. (Nov. 21 and Nov. 25 at 7:30. Frank van Aken replaces Jovanovich in the first performance.) • **Also playing:** Sonja Frisell's suitably grand production of *"Aida,"* a visual feast, has withstood the test of time. Marco Armiliato conducts a cast that features Liudmyla Monastyrskya, Olga Borodina, Marcello Giordani, and Željko Lučić in the leading roles. (Nov. 19 at 7:30 and Nov. 22 at 8.) • The admired Bulgarian soprano Sonya Yoncheva replaces Kristine Opolais in the role of Mimì in the latest revival of *"La Bohème,"* joined by Myrtò Papatanasiu, Ramón Vargas, and David Bizic; Riccardo Frizza. (Nov. 20 and Nov. 24 at 7:30.) • If February's premiere production of *"La Donna del Lago"* offers a chance to make a new acquaintance from the Rossini canon, then a revival of Bartlett Sher's durable staging of *"Il Barbiere di Siviglia"* lets us catch up with an old friend. The British baritone Christopher Maltman takes the title role of this eternally entertaining opera, with two young Met favorites, Isabel Leonard and Lawrence Brownlee, as Rosina and Count Almaviva; Michele Mariotti, the Met's Rossini man this season, is in the pit. (Nov. 22 at 1.) (Metropolitan Opera House. 212-362-6000.)

Juilliard Opera: "Il Turco in Italia"

Rossini's ebullient and complex comedy hasn't been staged in New York since New York City Opera mounted it for Beverly Sills in 1978. The up-and-coming opera conductor Speranza Scappucci leads these student performances, in a production directed by John Giampietro. (Peter Jay Sharp Theatre, Juilliard School. events.juilliard.edu. Nov. 19 and Nov. 21 at 8 and Nov. 23 at 2.)

ORCHESTRAS AND CHORUSES

New York Philharmonic

Jaap van Zweden, the New York-trained Dutch maestro who leads the Dallas Symphony and the Hong Kong Philharmonic, made a successful debut with the orchestra in 2012; now he returns for two weeks of concerts. The first program balances the dulcet grace of Mozart (the Sinfonia Concertante

in E-Flat Major for Violin and Viola, featuring the Philharmonic principals Sheryl Staples and Cynthia Phelps) with the savage beauty of Shostakovich (the Symphony No. 8 in C Minor). (Avery Fisher Hall. 212-875-5656. Nov. 20 at 7:30, Nov. 21 at 2, and Nov. 22 at 8.)

San Francisco Symphony

Michael Tilson Thomas brings his golden-toned ensemble, regular visitors to Carnegie Hall, back to town for two programs. The first features one of Thomas's specialties, Mahler's Seventh Symphony; the second brings on board the persuasive soloist Gil Shaham for a program of pieces by Samuel Adams (the New York premiere of "Drift and Providence"), Prokofiev (the Violin Concerto No. 2 in G Minor), and Ravel ("Daphnis et Chloé," complete). (212-247-7800. Nov. 19-20 at 8.)

American Composers Orchestra

Meredith Monk, this season's Composer's Chair at Carnegie Hall, contributes the culminating work ("Night," orchestrated by Monk and Allison Sniffin) in the latest Zankel Hall program from the intrepid orchestra, conducted by the unflappable George Manahan. The evening begins with premieres by A. J. McCaffrey ("Motormouth"), Ian Williams, Theo Bleckmann, and

Loren Loiacono. (212-247-7800. Nov. 21 at 7:30.)

"Black Mountain Songs"

In the nineteen-forties and fifties, Black Mountain College—where such icons as John Cage, Franz Kline, and Charles Olson taught—became a powerful force in the development of a potent and uncompromising American modernism. Today's young musical innovators are more inclined to mix the worlds of alternative rock and minimalism; among them are the composer-performers Bryce Dessner, Richard Reed Parry, Jherik Bischoff, and Caroline Shaw, who continue the collaborative spirit of Black Mountain in a concert of new works created for the talented and adventurous singers of the Brooklyn Youth Chorus. (BAM Harvey Theatre, 651 Fulton St., Brooklyn. bam.org. Nov. 20-22 at 7:30 and Nov. 23 at 3.)

RECITALS

JACK Quartet:

"Treatise on the Veil"

High-end art and music come together at the Morgan Library & Museum this week, as the masterly young quartet performs three of Matthias Pintscher's "Studies," inspired by Cy Twombly's majestic painting, which will be on view; arrangements of music

from Monteverdi's "Orfeo" will also be heard. (Madison Ave. at 36th St. themorgan.org. Nov. 20 at 7 and 9.)

Scandinavia House:

Music by Kaija Saariaho

To celebrate the U.S. launch of *Music & Literature* magazine, the eminent Finnish composer hosts an evening of her lustrous chamber works—including the Nocturne for Solo Violin, performed by Aliisa Barrière, and a world premiere—which also features readings by the magazine's publisher, Taylor Davis-Van Atta. (58 Park Ave., at 38th St. 212-847-9740. Nov. 20 at 8.)

The Complete Bach Organ Works

Paul Jacobs, a member of the Juilliard faculty and the young prince of American organists, curates an eighteen-hour Bach marathon (co-presented with WQXR), with the organ console at St. Peter's Church staffed in relay style by nineteen of Jacobs's current and former students; the Master himself will perform at 8. (Lexington Ave. at 54th St. wqxr.org. The music begins at 7 A.M. on Nov. 22 and ends on Nov. 23 at 1 A.M.)

Leonidas Kavakos and Yuja Wang

Sparks will doubtless fly when Wang, one of the most musically substantive

of today's young piano phenoms, teams up with Kavakos, a comparative veteran, to play sonatas for violin and piano by Brahms (No. 2 in A Major), Schumann, Ravel (the "Sonate Posthume"), and Respighi at Carnegie Hall. (212-247-7800. Nov. 22 at 8.)

The Romeros:

"¡Viva Andalucía!"

The first family of the guitar returns to the 92nd Street Y, a venue where fine guitarists, and their fans, have long been welcome. The Romero gentlemen—Pepe, Celin, Lito, and Celino—offer a slate of fiery and soulful music by such composers as Turina, Boccherini, Falla (music from "The Three-Cornered Hat" and "La Vida Breve"), and Granados. (Lexington Ave. at 92nd St. 212-415-5500. Nov. 22 at 8.)

Music at the Frick Collection

The eminent Baroque violinist John Holloway joins Jane Gower on dulciana (an ancestor of the bassoon) and Lars Ulrik Mortensen on harpsichord in a concert offering expressive music for their instruments by Froberger, Schmelzer, Castello, and Fontana, among others. (1 E. 70th St. 212-547-0715. Nov. 23 at 5.)

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MOVIES



OPENING BAD HAIR

A coming-of-age drama, directed by Mariana Rondón, about a nine-year-old boy in Caracas who wants to straighten his hair. In Spanish. Opening Nov. 19. (Film Forum.)

A GIRL WALKS HOME ALONE AT NIGHT

Reviewed in Now Playing. Opening Nov. 21. (In limited release.)

HAPPY VALLEY

Reviewed this week in The Current Cinema. Opening Nov. 19. (In limited release.)

THE HUNGER GAMES: MOCKINGJAY—PART I

A sequel in the young-adult series adapted from books by Suzanne Collins. Directed by Francis Lawrence; starring Jennifer Lawrence, Josh Hutcherson, and Liam Hemsworth. Opening Nov. 21. (In wide release.)

THE KING AND THE MOCKINGBIRD

An animated film from 1980, based on a story by Hans Christian Andersen and directed by Paul Grimault. Opening Nov. 21. (Film Society of Lincoln Center.)

PULP: A FILM ABOUT LIFE, DEATH & SUPERMARKETS

Florian Habicht directed this documentary, about the rock band Pulp and its farewell concert. Opening Nov. 19. (In limited release.)

REACH ME

In this drama, Sylvester Stallone plays the author of a motivational book that becomes an Internet sensation. Directed by John Herzfeld; co-starring Tom Berenger, Kevin Connolly, and Kyra Sedgwick. Opening Nov. 21. (In limited release.)

THE STORY OF MY DEATH

Reviewed in Now Playing. Opening Nov. 20. (Anthology Film Archives.)

REVIVALS AND FESTIVALS

Titles in bold are reviewed.

ANTHOLOGY FILM ARCHIVES

"An Homage to Paul Scheerbart." Nov. 20 at 7:30: "Light Club" (2008, Jeff Preiss and Josiah McElheny), followed by a discussion

NOW PLAYING

Actress

The real-life actress Brandy Burre, a regular on "The Wire," left show biz, had two children, and moved, with her partner, Tim Reinke, to Beacon, New York. In Robert Greene's documentary about her effort to return to the business (and the art) of acting, she gets the role of a lifetime—herself. Doing his own cinematography, Greene (at that time Burre's neighbor) becomes a virtual part of her household, and his camera becomes Burre's confidant, framing her in a confessional mood. But her attempt at reinvention comes at the price of her relationship with Reinke, a restaurateur (who is present in the film, along with their young children, Henry and Stella). For Burre, artistic and erotic desire are fused; she sees her life as a series of roles—mom conflicts with actress, partner with lover—and her struggle for fulfillment links creative work with economic independence. Her story is the stuff of classic melodrama, and that's how Greene, astonishingly, films it: his images, with their shrieking colors and vertiginous geometry, suggest the intimate grandeur and bitter irony of a Douglas Sirk romance come to life. —*Richard Brody* (In limited release.)

Birdman

Twenty years ago, Riggan Thomson (Michael Keaton) was flying high. He was the star of the Birdman movies, winged with superhuman powers. Since then, his fame has plunged, and now he is launching himself anew by writing, directing, and starring in an adaptation of a Raymond Carver tale on Broadway. Caught in the whirl of this task are his daughter (Emma Stone), his best friend (Zach Galifianakis), his lover (Andrea Riseborough), and his ex-wife (Amy Ryan). Also present is Mike Shiner (Edward Norton), an actor who joins Riggan's cast, which happens to include *his* lover (Naomi Watts), and who tussles with Riggan in almost every possible way. The movie, directed by Alejandro González Iñárritu, is hectic and crammed, yet it streams along, appearing to unroll in a single, flowing take, which all but erases the border between Riggan's everyday gripes and his daydreams; with a click of the fingers, he can summon fireballs, as Birdman used to do. Keaton, a former Batman, has lost not a watt of his nervous energy, and he enlivens the film as Javier Bardem did in "Biutiful," Iñárritu's

previous work. But that film seemed like an act of mourning, whereas here the New York setting and the follies of the dramatic trade have chivvied the director into comedy for the first time. If the humor is dark and fringed with fears of loss, so much the richer. —*Anthony Lane* (Reviewed in our issue of 10/20/14.) (In limited release.)

Foxcatcher

A true story, and one that's more worryingly strange than anything Marvel could dream up. Two muscular brothers, Mark and Dave Schultz (Channing Tatum and Mark Ruffalo), each of whom has an Olympic gold medal for wrestling, are approached and recruited by John du Pont (Steve Carell), who has incalculable wealth, all of it inherited, and a sinister passion for wrestling. Mark is keener than Dave, but both eventually succumb. Their patron offers to house them, train them, and fund them, together with a squad of their fellow-fighters; his motives include a longing for national glory, an awkward suppression of sexual drives, and a pitiful wish to please his elderly mother (Vanessa Redgrave)—who considers wrestling a "low sport," and prefers horses. The director, Bennett Miller, wants the tale to tell home truths about money and ambition in America, and the disabling effects of both. Whether it has quite as much to say as he hopes—whether John, for instance, might be just a one-off weirdo—is open to debate, but there is no doubting the dramatic pressure that Miller wields and builds. The result is solemn to a fault, low of light and mood, carefully photographed by Greig Fraser, with performances of a matching intensity. There are comic chances here, but even Carell spurns most of them, despite being armed with a formidable false nose. —*A.L.* (11/17/14) (In limited release.)

Fury

David Ayer's fictional account of an American tank crew fighting in Germany in April, 1945, lacks poetry and greatness of spirit, but it's one of the most exciting and frightening combat films ever made. The Americans know they will triumph sooner or later, but at the moment they feel like a losing army. Their medium-weight Sherman M4 tanks, fast and maneuverable, are badly outgunned by the heavy new German Tigers, and Ayer, holding


to the illusion of realism (coherent and continuous space, no fantasy, no "Inglourious Basterds"-style cartoonishness), brings us close to the terrors of fighting in what seems like a mobile and highly flammable prison. With Brad Pitt, as Top, the inexorable tank commander; the blunt Michael Peña, as the driver; Shia LaBeouf, showing an entirely new style of performance, as Boyd (Bible) Swan, the gunner; Jon Bernthal, as the growling Neanderthal, Grady (Coon-Ass) Travis; and Logan Lerman, as Norman, the inevitable pale, skinny neophyte, who is dragooned by the others into the higher wisdom of war, which is that you either kill or get killed. Photographed by Roman Vasyanov; edited by Jay Cassidy and Dody Dorn. Shot entirely in England. —*David Denby* (10/27/14) (In wide release.)

A Girl Walks Home Alone at Night

This tightly scripted, pictorially lavish, downbeat romantic fantasy—the first feature written and directed by Ana Lily Amirpour—is set in a desolate Iranian town but was filmed in California. The story begins with Arash (Arash Marandi), an urban-hipster type, losing his prized vintage Thunderbird to his father's heroin dealer, who's also a brutally abusive pimp. But a mysterious young woman (Sheila Vand)—a vampire who prowls like an avenging angel in a black chador—takes matters into her own hands and metes out justice. In the course of his own nocturnal rambles, Arash encounters the woman and a tentative, tenuous relationship develops. Amirpour's wide-screen, high-contrast black-and-white images heighten the familiar mood of low-rent high style, but her greater gift is choreographic: she ramps up suspense through the actors' sinuous glides and dreamlike stillness, and she conjures magic with the rhythms of a few striking cuts. The fablelike drama offers a powerful symbolic display of feminine power and outlaw charm; one scene, involving a young boy whom the vampire terrifies, suggests a Woody Allen-like dark comedy that portends a lifetime of neuroses and the new generation's gender wars. In Farsi. —*R.B.* (In limited release.)

Goodbye to Language

Shooting with largely handheld, lightweight, homemade 3-D video equipment, Jean-Luc Godard realizes, at the age of eighty-three, an ideal



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with the directors. • Nov. 21 at 7:15: "The Light Club of Vizcaya—A Women's Picture" (2012, McElheny) and "Sins of the Fleshpoids" (1965, Mike Kuchar). • Nov. 21 at 9:15 and Nov. 23 at 7:30: "Alphaville" (1965, Jean-Luc Godard). • Nov. 22 at 8: Short films, including "Heart of the World" (2000, Guy Maddin), followed by a discussion with the translator Susan Bernofsky and the director.

BAM CINÉMATEK

In revival. Through Nov. 25 (call for showtimes): "The Sacrifice." • New York Korean Film Festival. Nov. 20 at 7:15: "Gyeongju" (2014, Zhang Lu). • Nov. 21 at 7: "The Attorney" (2013, Yang Woo-seok). • Nov. 21 at 9:40: "A Hard Day" (2014, Kim Seong-hun). • Nov. 22 at 6:45: "The Admiral: Roaring Currents" (2014, Kim Han-min). • Nov. 22 at 9:30: "Man on High Heels" (2014, Jang Jin). • Nov. 23 at 7:30: "Futureless Things" (2014, Kim Kyung-moo). • Nov. 23 at 4:45: "The Pirates" (2014, Lee Suk-hoon).

FILM FORUM

In revival. Through Nov. 27 at 1:10, 3:10, 5:10, 7:15, and 9:30: "Le Jour Se Lève."

FILM SOCIETY OF LINCOLN CENTER

The films of Rainer Werner Fassbinder. Nov. 19 at 3:30: "The Stationmaster's Wife" (1977). • Nov. 23 at 1 and Nov. 26 at 8:30: "Querelle" (1982). • Nov. 24 at 4:30 and Nov. 25 at 6:30: "The Niklashausen Journey" (1970). • Nov. 24 at 8:30 and Nov. 25 at 4:15: "The Third Generation." • Nov. 25 at 8:30: "Germany in Autumn" (1978, Fassbinder, Alexander Kluge, et al.). • "Fassbinder and His Friends." Nov. 20 at 3: "The Damned" (1969, Luchino Visconti). • Nov. 21 at 3:30 and Nov. 26 at 6:30: "The Wizard of Babylon" (1982, Dieter Schidor). • Nov. 23 at 3:15: "Rainer Werner Fassbinder—Last Works" (1982, Wolf Gremm).



MOVIE OF THE WEEK

A video discussion of Wim Wenders's "The Wrong Move," from 1975, in our digital edition and online.

that he has pursued for forty years: sketchlike images, made casually and spontaneously, that are endowed with the power and the grandeur of studio-era cinematography. The idea that they reveal is the essential one in Godard's later work—the romantic implications of political philosophy and the history of cinema—and it's brought to life in a collage of scenes about two couples in Switzerland, near Lake Geneva. One couple confronts the political crises of twentieth-century Europe amid espionage and violence. The other couple faces erotic conflicts that play out against a backdrop of clips from classic movies. And then there's a dog, Roxy Miéville, who wanders through a glorious landscape that Godard's methods raise to painterly glory (a river in which Roxy frolics is a late Monet in motion). His 3-D technique is the first advance in deep-focus camerawork since the heyday of Orson Welles; it lends the settings a sumptuous intimacy as it restores the astonishment of sheer perception to the art of the cinema. A concluding flourish—with Godard himself, a painter in his youth, giving a young artist lessons in watercolor—looks tenderly into the future. —R.B. (In limited release.)

The Homesman

Tommy Lee Jones directs and stars in a new Western; its direction of travel is easterly, however, and the pioneering spirit is all but snuffed out. He plays a ne'er-do-well named George Briggs, saved from the gallows by a dauntless spinster, Mary Bee Cuddy (Hilary Swank), who needs a helper as she drives a wagon to Hebron, Iowa. Her cargo consists of three wives driven insane by conditions in the Nebraska Territory, where crops have failed and children have died. From these bleak elements, Jones has fashioned a typically patient piece of work; as in "The Three Burials of Melquiades Estrada" (2005), he finds time for patches of genuine whimsy, as well as for narrative twists designed not for the sake of cleverness but in tribute to the cussedness of fate. The poor madwomen are given almost no voice at all, yet female presences dominate the film; Meryl Streep has a finely judged cameo toward the end, while Swank—who, as usual, has waited a few quiet years before delivering another performance of true grit—is evidently made of tougher stuff than the men around her. —A.L. (11/17/14) (In limited release.)

Interstellar

In Christopher Nolan's new spectacle, the Earth has had it, and a team of scientist-astronauts (led by Matthew McConaughey and Anne Hathaway) travel through a wormhole and into distant galaxies, seeking planets on which humanity may be able to exist. Moving through the altered space-time continuum, the crew

members snap at each other testily, making use, in passing, of Einstein's theories, as well as speculations by Stephen Hawking and Kip Thorne. Black holes, relativity, singularity, the fifth dimension! The talk is grand but delivered in a rush, and, in competition with Hans Zimmer's swelling music, it hardly functions in the story, even though it's central to the action. The film is a grandiose, redundant puzzle, sometimes beautiful and moving; in the best scene, the crew returns from a brief jaunt away from their craft only to discover that, on Earth, more than twenty years have passed. McConaughey's young daughter, now a woman (played by Jessica Chastain), confronts her father on video, fighting and loving him at the same time. The movie's message seems to be: To hell with the Earth—love will hold us together. With Michael Caine, Wes Bentley, Matt Damon, Mackenzie Foy, and David Gyasi. Bill Irwin provides the voice of a querulous robot. —D.D. (11/10/14) (In wide release.)

Le Jour Se Lève

This prototype of film noir, from 1939, is both a grim feast of prewar French acting and a catalogue of French moods on the eve of disaster. It begins with François (Jean Gabin), a diamond-hard laborer, killing Valentin (Jules Berry), an unctuous con man, in a shabby residential hotel, and retracing in flashbacks the steps that led to murder. The director, Marcel Carné, roves the staircases and the alleys of proletarian Paris and its suburbs, capturing an eerie tone of science fiction in the factory where François spray-paints metal. There, he and Françoise (Jacqueline Laurent), a naïve gamine, meet cute, but their romance is shadowed by the predatory Valentin, and also by Clara (Arletty), a world-weary artiste. The dialogue, by Jacques Prévert, has a self-conscious streetwise flavor that the actors deliver with extra spice. Blending romantic despair with violent moods, theatrical volubility with oppressive silence, the movie captures a society of contradictions at a tragic breaking point. When François, besieged by armed officers, screams, "I want peace! Peace!" he seems to speak for a panic-stricken nation. In French. —R.B. (Film Forum; through Nov. 27.)

Listen Up Philip

In this bitter and hectic comedy, the director Alex Ross Perry shows us the life of the mind: an endless round of humiliations inflicted and endured, in which everyone is keeping score. Jason Schwartzman plays the rising literary star Philip Lewis Friedman, who isn't rising as fast or as high as others are, which is driving him crazy. Befriended by the famous elderly novelist Ike Zimmerman (Jonathan Pryce), the vain and abrasive Philip abandons the Brooklyn apartment

that he shares with his longtime girlfriend, the photographer Ashley Kane (Elisabeth Moss), and moves upstate to Ike's rustic house and to a teaching job at a nearby university. In a brilliant dramatic stroke, Perry—who analyzes the action in real time through a trenchant voice-over spoken by Eric Bogosian—turns his attention to Ashley and her efforts to pick up the pieces after the sudden, agonized breakup, and then to Ike, whose own intimate life is in shambles after decades of obsessive literary devotion. Applying cinematic auteurism to actual authors, Perry—greatly aided by Sean Price Williams's tactile and probing cinematography—leaps into the maelstrom of creative fury and finds its victims. —R.B. (In limited release.)

Little Lise

Inky despair flows freely in prewar French working-class dramas, and this one, from 1930, directed by Jean Grémillon, adds a raw and thrashing physicality to its implacably bitter moods. The hulking and brooding Victor Berthier (Pierre Alcover), exiled to a penal colony in French Guiana for murdering his wife, is pardoned for his bravery in a prison fire and sent home to Paris, where his grown daughter, Lise (Nadia Sibirskaia), the apple of his eye, inhabits a grungy Right Bank hotel and—unbeknownst to him—is working as a prostitute. André (Julien Bertheau), her pimp and lover, needs money quickly to buy a garage and win the couple a toehold on respectability, and his criminal plot soon spoils her father's happy homecoming. In Grémillon's grim vision, day and night are equally submerged in sepulchral melancholy, and the solemn camaraderie of factory life and the sweaty oppression of prison are bound together by a volatile air of imminent violence that's as likely to explode for love as for money. In French. —R.B. (Museum of the Moving Image; Nov. 22.)

National Gallery

The documentary filmmaker Frederick Wiseman offers an enraptured view of a great cultural institution—London's National Gallery—as it struggles and succeeds in its task of preserving and exhibiting art amid declining government support. He displays his own wide-spanning curiosity about the life of the institution by blending closeup views of the paintings themselves with his observation of framers, restorers, floor polishers, budget-makers, curators, and scholars at work. The museum's interior is neoclassical, and Wiseman's severely restrained style of filmmaking matches it perfectly. His focus on looking and his contemplation of the public engaged in looking—the ultimate purpose of visual art—holds the movie viewer in a state of intense and pleasurable concentration, aided by insights from a remarkably lively group of docents (mostly English

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MUSEUM OF MODERN ART

"Acteurism: The Emergence of Ann Sheridan, 1937-1943." Nov. 19-21 at 1:30: "Winter Carnival" (1939, Charles Riesner). • "To Save and Project." Nov. 19 at 4: "Stage Sisters" (1964, Xie Jin). • Nov. 19 at 4:30: "The White Game" (1968, Grupp 13), introduced by Richard Porton, the editor of *Cineaste*. • Nov. 20 at 4 and Nov. 21 at 7:15: "The Fate of a Man" (1959, Sergey Bondarchuk). • Nov. 20 at 7 and Nov. 21 at 4:30: Short 3-D films, including "Around Is Around" (1951, Norman McLaren). • Nov. 22 at 5:15: Short films by Charlie Chaplin, including "Easy Street" (1917).

MUSEUM OF THE MOVING IMAGE

The films of Jean Grémillon. Nov. 21 at 7: "Light of Summer" (1943). • Nov. 22 at 2:30: "The Lighthouse Keepers" (1929). • Nov. 22 at 4:30: "Little Lise." • Nov. 23 at 7:30: "Lady Killer" (1937). • Contemporary Brazilian cinema. Nov. 22 at 7: "My Mother Is a Character" (2013, Andre Pellenz). • Screenings and book signings. Nov. 23 at 2: "The Awful Truth" (1937, Leo McCarey), introduced by Farran Smith Nehme, the author of the novel "Missing Reels," and followed by a book signing. • Nov. 23 at 4:30: "Strange Days" (1995, Kathryn Bigelow), introduced by Peter Labuza, the author of "Approaching the End: Imagining the Apocalypse in American Film," and followed by a book signing.



GOINGS ON

The Metropolitan Museum offers two concerts this week that showcase its extraordinary collection of musical instruments.

and Irish women) about Rembrandt, Leonardo, Vermeer, Rubens, Turner, and other Old Masters. The guides, the public in the gallery, and now the viewers of the movie live gratefully within the gaze of the masterpieces, which, glowing from restoration, look back at us with imperious strength.—D.D. (In limited release.)

Nightcrawler

Lou Bloom (Jake Gyllenhaal) is a missionless young man in Los Angeles, surviving on minor theft. By chance, he falls into a more rewarding trade: hastening to accidents and crime scenes, filming them, then hawking the results to TV news. Lou finds an eager buyer in Nina (Rene Russo), a producer on the vampire shift, who needs extreme material to feed the ratings. This kind of morality tale is hardly news—Nina, for instance, is foreshadowed by the Faye Dunaway character in "Network"—and if you crave understatement you may need to look elsewhere, but Dan Gilroy, making his debut as a director, delivers something as alarming as freshly spilled blood. Few stories this ghoulish can summon such an urgent sense of pace. Gyllenhaal, his features haunted and starved, adds another memorable figure to his gallery of obsessives (see "Zodiac" and "Source Code"), and shows us how easy it is, when faced with disaster, to stay up close yet impersonal, and how even the weirdest of prowlers can promote himself as a bustling entrepreneur. To prey on the defenseless and the dead, the movie tells us, is no longer the prerogative of vultures. It's a business.—A.L. (11/3/14) (In wide release.)

The Sacrifice

Andrei Tarkovsky's last film, from 1986, is a grand, unworldly, even antiworldly religious vision that depends on its perfect pitch to avoid absurdity and bathos. Alexander (Erland Josephson), a middle-aged critic, lives in a remote waterfront manor in rural Sweden with his frustrated wife, Adelaide (Susan Fleetwood), her grown daughter, Martha (Filippa Franzén), and their young son (Tommy Kjellqvist), called only Little Man, who, after minor surgery, cannot speak. The action is set on Alexander's birthday. He receives greetings, presents, and visits, but suddenly the house shakes with the thunder of military aircraft and a television broadcast announces an imminent nuclear attack. The members of the household and their guests are on the verge of a collective breakdown as they face the end, but Alexander's friend Otto (Allan Edwall), a postman and retired history teacher, offers him a metaphysical bargain to save the world. The blend of midlife crisis and existential terror is reminiscent of the films of Ingmar Bergman, but Tarkovsky makes it a world of his own. His images have a transcendental

glow and a hieratic poise; alternating between contemplative distance and moral confrontation, they assert, in the most radical sense, the high cost of living—the unbearable price of earthly delights. In Swedish.—R.B. (BAM Cinématek; through Nov. 25.)

The Story of My Death

Though quiet in tone and contemplative in manner, Albert Serra's historical drama, set in a Swiss villa and a Balkan estate, far from royal courts and teeming cities, brings exotic passions of the eighteenth century to furious life. An unnamed aristocrat getting on in years, periwigged and pomaded, speaks with a connoisseur's insight and a scientist's skepticism on matters of love and politics, society and nature. Anticipating a revolution in France, discussing the sexual license of the Catholic Church, unfolding the art of seduction, this quasi-Casanova—played with dialectical intensity and spidery focus by Vicenç Altaió—outlines the subjects for his planned memoir. Meanwhile, he uninhibitedly pursues carnal pleasures, underlining erotic glee with crazed laughter and desperate tears. But, along with his obsessive attention to bodily functions, there will be blood, and his curiosities fuse the empirical with the vampirical. Filming in spare settings dominated by velvety light and hidden sounds—wind and birdsong, footfalls and the crunch of chewed food—Serra creates rigid, highly pressurized images on the verge of shattering with the force of mystery and desire. In Catalan.—R.B. (Anthology Film Archives.)

The Theory of Everything

James Marsh directed this drama, about the marriage of the young physicist Stephen Hawking (Eddie Redmayne) and Jane Wilde (Felicity Jones), who treats her husband's enfeebled body with love and the toughening discipline of a British Army sergeant. Set largely at Cambridge University, the movie plays as a genteel great-man bio-pic. Redmayne's performance is in the same league as Daniel Day-Lewis's in "My Left Foot." With his narrow shoulders, Redmayne initially looks like an abashed scarecrow. He acts with his eyebrows, his mouth, a few facial muscles, and the fingers of one hand, and he suggests not only Hawking's intellect and humor but also the calculating vanity of a genius entirely conscious of his effect on the world. We're puzzled, at the end, by the black hole in Hawking's character that causes him to leave, after years of marriage, the devoted, accomplished, and beautiful Jane for a young nurse (Maxine Peake), who looks like Ann-Margret and talks to him like a child that she can dominate. The screenwriter Anthony McCarten adapted Jane Hawking's memoir, "Travelling to Infinity: My Life with Stephen."

Co-starring David Thewlis.—D.D. (11/10/14) (In limited release.)

The Third Generation

The Baader-Meinhof Gang's attacks provide the backdrop for Rainer Werner Fassbinder's hectic, funny, prismatically intricate political thriller, from 1979. It begins with a high-rolling businessman (Eddie Constantine), in a chilling modern office high above Berlin, at work with his assistant (Hanna Schygulla), who turns out to be a mole from a revolutionary cell that is plotting spectacular crimes. The teeming cast of characters includes a cynical police detective (Hark Bohm) whose son (Udo Kier) is one of the plotters, and a drug addict (Y Sa Lo) who brings a former Army explosives specialist (Günther Kaufmann) into the group. Slapstick comedy (including a game of keep-away with a volume of Bakunin) and oddball habits (the terrorists dress like prewar gangsters and play Monopoly) contrast with wild visions (as when the detective dreams that "capitalism invented terrorism to force the state to protect it better"). The film's intertitles are taken from bathroom graffiti; its cinematic references (to Bresson, Tarkovsky, and, especially, Godard) are clever and apt, and the few action scenes are filmed with a razor-sharp pulp efficacy. Fassbinder's blend of paranoia and whiz-bang wonder is the modern successor to Fritz Lang's "Dr. Mabuse" films. In German.—R.B. (Film Society of Lincoln Center; Nov. 24-25.)

Thou Wast Mild and Lovely

Josephine Decker's visionary second feature, a rural melodrama, is imbued with the blood and the muck, the harshness and the carnality of life on a farm. Akin (Joe Swanberg), a hired hand, leaves his wife and child behind for a summer job at a ranch belonging to Jeremiah (Robert Longstreet), and begins an affair with his boss's grown daughter, Sarah (Sophie Traub). The stark setup gives rise to flights of cinematic invention that are as psychologically probing as they are aesthetically thrilling. The script (which Decker co-wrote with David Barker) gives the characters intimate idiosyncrasies that mesh in moments of eroticism and clash in scenes of violence. Swanberg, a frequent performer in his own films, is wracked with Akin's hidden wounds; Traub balances ethereal fancy with blunt practicality and tragic sensuality; and Longstreet lends Jeremiah the destructive fury of a Biblical patriarch. The animals on the farm, the rugged yet soaring landscape, the light and the weather are crucial to the action as well. Decker's ecstatic fusion of the material world and the inner life is realized by the cinematographer Ashley Connor, whose camera has the bold agility of a paintbrush, ranging from microscopic precision to cosmic turbulence.—R.B. (IFP Media Center.)

PASO ROBLES

LOCAL KNOWLEDGE^{NO.} 4

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Illustration by Dan Bransfield

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TABLES FOR TWO

UPLAND

345 Park Ave. S. (212-686-1006)

THE DRONE OF CONTEMPT about the impossibility of finding a proper taco in New York is a defining characteristic of West Coast transplants. Down the drab end of Park Avenue, though, Justin Smillie is filling a lesser-known gap in the city's offerings of Californian cuisine. Upland, named for the town in which Smillie grew up, is a retreat from the beach to the badlands at the foot of the San Gabriel Mountains, with a menu of teeming pizzas and robust meat dishes.

The restaurant opened in late October, and on some early visits enthusiasm trumped detail: a chilled sea-urchin spaghetti was an "homage to Chef's favorite East Village restaurant," though no one could remember which one. Sadly, the lemon in the creamy sauce wasn't as elusive, and wading through the thickly coated farro noodles for a few globs of sea urchin was an exercise against the clock, before the sauce coagulated entirely. Mostly, though, there's payoff to those big, straightforward flavors: the only quotation marks on the menu, thank goodness, are around "Caesar," and they're not even needed, because the garlic-anchovy dressing on the salad was spot on, an invigorating saline embrace to which even the heartiest lettuces can only succumb. There's an exuberance, too, to the pork-chop dish, served with its crackling skin intact, in a plating that resembles a Dutch still-life: crescents of ripe, roasted persimmons; long, charred slivers of spring onion; and bright-red fingers of Jimmy Nardello peppers, a sweet heirloom variety, rarely found outside California. Fruit with pork isn't new, but persimmons make for an especially juicy combination, and it's one of those rare occasions when an entrée trumps the easy, cheesy thrills of the appetizers that came before.

Not that those don't exist in abundance: the pizza section of the menu caters to after-work happy-hour gatherings, those great six o'clock stampedes of the Flatiron district's relatively cavernous spaces which for a moment each day make it feel like D.C. The happy crowds are already flocking to the equally cheery bar area of Upland, for rejiggered mint juleps made from mezcal, an unusually fragrant Italian sour, and a bourbon cocktail finished with shaved nutmeg that tickles the nose. Given these persuasively boozy creations, the pizzas are much better than they need to be: blistered and chewy, with almost oddball toppings, like walnut pesto, shiso, and straciatella. Most of the drinkers don't move into the brasserie-like dining area, where preserving jars filled with artichokes and lemons glow amber, and diners must roll up their sleeves to engage with the messy but memorable bucatini alla carbonara. There's an irresponsible amount of pancetta sprinkled on top of the porky sauce. What does it have to do with California? Who cares. Authenticity's got no chance against bacon bits.

—Amelia Lester

Open daily for dinner. Entrées \$16-\$52.

PHOTOGRAPH BY JAMES POMERANTZ



FOOD & DRINK

BAR TAB ALDO SOHM WINE BAR

151 W. 51st St. (212-554-1143)

Aldo Sohm, the person, is the longtime wine director at Le Bernardin, Eric Ripert's three-Michelin-star haute-seafood mainstay around the corner from Aldo Sohm, the new wine bar, which opened in September. Sohm is young and Austrian. He feels that wine should be fun, and his space is friendly, both airy and cozy. There's a high ceiling, tall oak shelves, colorful décor—Haring paintings, miniature Pantone chairs, a Calder mobile—quiet eighties pop, and a pleasing geometric harmony, centered on a low, comfy bracket-shaped couch ringing a carpet dotted with little tables and ottomans. You feel like you're sitting on modern art, looking at modern art, and eating and drinking modern art. "Everybody coming in is happy. I feel like I'm in Heaven!" an out-of-towner said on a recent rainy weeknight. "Don't forget, I'm reading Dante." A waiter recommended the 2011 Vietti Nebbiolo Perbacco—a spicy, medium-bodied red with a very direct appeal—which paired well with little delights from Ripert's food menu: baby beets on a skewer, cauliflower with chicken salt, a subtle but staggeringly delicious truffle pasta with grated yak cheese. "Do you get any dry violets in the nose?" the waiter asked, of the Nebbiolo. Sure you do: sounds like fun.

—Sarah Larson



THE THEATRE

ALSO NOTABLE BEAUTIFUL—THE CAROLE KING MUSICAL

Stephen Sondheim

THE BOOK OF MORMON
Eugene O'Neill

BY THE WATER
City Center Stage II

CABARET
Studio 54

CHAIRS AND A LONG TABLE
Clurman. Through Nov. 22.

THE COUNTRY HOUSE
Samuel J. Friedman.
Through Nov. 23.

**THE CURIOUS INCIDENT OF
THE DOG IN THE NIGHT-TIME**
Ethel Barrymore

**HEDWIG AND THE ANGRY
INCH**
Belasco

GENERATIONS
SoHo Rep. Through Nov. 23.

**A GENTLEMAN'S GUIDE TO
LOVE AND MURDER**
Walter Kerr

IF/THEN
Richard Rodgers

IT'S ONLY A PLAY
Schoenfeld

THE LAST SHIP
Neil Simon

LOVE LETTERS
Brooks Atkinson

MAJOR BARBARA
Pearl

MATILDA THE MUSICAL
Shubert

LES MISÉRABLES
Imperial

ON THE TOWN
Lyric

OUR LADY OF KIBEHO
Pershing Square Signature
Center

PUNK ROCK
Lucille Lortel

THE RIVER
Circle in the Square

SIDE SHOW
St. James

STICKS AND BONES
Pershing Square Signature
Center

STRAIGHT WHITE MEN
Public

THIS IS OUR YOUTH
Cort

WICKED
Gershwin

YOU CAN'T TAKE IT WITH YOU
Longacre

OPENINGS AND PREVIEWS Allegro

John Doyle directs the Rodgers and Hammerstein musical from 1947, about a Midwestern doctor who marries his high-school sweetheart and then becomes cynical. Opens Nov. 19. (Classic Stage Company, 136 E. 13th St. 866-811-4111.)

Asymmetric

Mac Rogers wrote this spy thriller, about a star C.I.A. employee who loses his wife, a fellow-spy, and his job, only to be called back to duty. Jordana Williams directs. Opens Nov. 19. (59E59, at 59 E. 59th St. 212-279-4200.)

Christmas Memory

Irish Rep presents a musical stage adaptation of the Truman Capote story, set in 1955, with flashbacks to Alabama in 1933, about a young boy being raised by his eccentric relatives. Previews begin Nov. 25. (DR2, at 103 E. 15th St. 212-727-2737.)

A Delicate Balance

Glenn Close, John Lithgow, Lindsay Duncan, Bob Balaban, Clare Higgins, and Martha Plimpton star in a revival of Edward Albee's play, from 1966, in which a suburban couple living with the woman's alcoholic sister are visited by their best friends, and by their daughter, fresh from the breakup of her fourth marriage. Pam MacKinnon directs. In previews. Opens Nov. 20. (Golden, 252 W. 45th St. 212-239-6200.)

The Elephant Man

Bradley Cooper, Patricia Clarkson, and Alessandro Nivola star in a revival of Bernard Pomerance's 1979 play, based on the true story of Joseph Merrick, a severely deformed man who became famous on the British freak-show circuit in the late eighteen-hundreds. Scott Ellis directs. In previews. (Booth, 222 W. 45th St. 212-239-6200.)

Honeymoon in Vegas

Tony Danza, Rob McClure, and Brynn O'Malley star in Andrew Bergman and Jason Robert Brown's new musical, based on the 1992 movie. Gary Griffin directs. In previews. (Nederlander, 208 W. 41st St. 866-870-2717.)

Me, My Mouth and I

Joy Behar wrote and stars in this autobiographical one-woman show. In previews. Opens Nov. 23. (Cherry Lane, 38 Commerce St. 866-811-4111.)

A Particle of Dread (Oedipus Variations)

Signature Theatre Company and Field Day Theatre, of Ireland, present the U.S. premiere of Sam Shepard's play, a dark modern take on "Oedipus Rex," starring Stephen Rea. Nancy Meckler directs. In previews. Opens Nov. 23. (Pershing Square Signature Center, 480 W. 42nd St. 212-244-7529.)

Pitbulls

Rattlestick presents a play by Keith Josef Adkins, directed by Leah C. Gardiner, about a woman and her son in a black community in the Bible Belt of the Appalachian Mountains who are accused of killing a prized pit bull. In previews. Opens Nov. 20. (224 Waverly Pl. 866-811-4111.)

Pocattello

David McCallum directs the world premiere of a new play by Samuel D. Hunter ("The Whale"), about a manager of an Italian chain restaurant in a changing city in Idaho. Starring T. R. Knight. Previews begin Nov. 21. (Playwrights Horizons, 416 W. 42nd St. 212-279-4200.)

The Tempest

La Mama presents the Shakespeare play, transposed to fifth-century Korea, performed by the Mokwha Repertory Company. Nov. 20-23. (Ellen Stewart, 66 E. 4th St. 212-475-7710.)

Tristan & Yseult

Kneehigh presents a play about forbidden love, written by Carl Grose and Anna Maria Murphy, adapted and directed by Emma Rice. In previews. Opens Nov. 24. (St. Ann's Warehouse, 29 Jay St., Brooklyn. 718-254-8779.)

NOW PLAYING

Accept "Except" LGBT NY

When an angry young black lesbian (Tuluv Maria Price) is chased up a tree in Central Park by a mob of gay bashers, she's met by the ghost of a closeted black slave (Tyree L. Young) who was lynched there in 1742. The two talk, and, despite the marauders below, the slave can't believe the freedoms both blacks and homosexuals have won in the last three hundred years. Though this New Federal Theatre production of Karimah's play, directed by George Faison, has its heart in the right place, it's more educational than entertaining, and might do better for a teen-age audience. (Castillo, 543 W. 42nd St. 212-941-1234. Through Nov. 23.)

Disgraced

The minute the excellent, humorous Karen Pittman walks onstage in Ayad Akhtar's Pulitzer Prize-winning drama, she exposes all the bad acting that has come before, as well as all that is boring and sensationalistic in this ninety-minute work about cultures clashing. Pittman plays Jory, a sleek lawyer at a high-powered firm where her colleague Amir (the handsome

Hari Dhillon) is slowly unravelling: he wants to be a partner but is coming undone by all the racism he feels he must combat in order to be seen as a valued colleague. Amir, a Pakistani married to a white painter named Emily (played with no energy and no imagination by Gretchen Mol), whose biggest artistic influence is Islamic art, may just be a creep—perceived racial slights and his internalized racially influenced self-hatred can't excuse his poor, self-indulgent behavior. Emily seeks the approval of Jory's husband, Isaac (played well by Josh Radnor), a Whitney curator. Akhtar's writing, while lively and clear, is journalism onstage: we're made very aware of the "issues." The only time they get blurred and achieve some depth is when Pittman is circling her friends and adversaries, never quite certain when they're one or the other. (Lyceum, 149 W. 45th St. 212-239-6200.)

Grand Concourse

The playwright Heidi Schreck specializes in focussed responses to big dialectics—good and evil, faith and doubt, loyalty and betrayal. In this drama, she settles into a Bronx soup kitchen governed by Shelley (Quincy Tyler Bernstine), a no-nonsense nun. When Emma (Ismenia Mendes), a fragile teen-ager on a break from college, comes to volunteer, she takes a knife to the carrots and potatoes, and to Shelley's moral center, too. Rachel Hauck's ultrarealist set steals the show, though Kip Fagan coaxes forceful, deeply felt performances from the leads, and from Bobby Moreno as a boisterous security guard. An actress as well as a writer, Schreck supplies flavorful, playable dialogue, yet the themes don't resonate as strongly as they might. Actions and announcements that should startle and dismay stay safely within the world of the play, bubbling away on the stove. (Playwrights Horizons, 416 W. 42nd St. 212-279-4200.)

Lost Lake

David Auburn's portrait of two lonely souls, presented by Manhattan Theatre Club, is set at a lake house—not a "rustic" vacation spot but a dump, with broken shutters and no hot water. Its desuetude matches that of its owner, Hogan (John Hawkes), a screwup perpetually short on money and human contact. Somehow, he manages to rent the place to Veronica (Tracie Thoms), a black single mother who works at a hospital in the city. In deft, beautifully acted scenes—Auburn ("Proof") knows how to parcel out surprising revelations by the teaspoon—Hogan and Veronica spar over security deposits, but as their desperation surfaces they form a glimmer of connection. Auburn's shrewdness and craft, Daniel Sullivan's sensitive direction, and both actors' openness give the story a poignant, painful core. (City Center Stage I, 131 W. 55th St. 212-581-1212.)

The Oldest Boy

A young mother (Celia Keenan-Bolger) still co-sleeps with her nearly three-year-old son, and breast-feeds him “just a little bit.” In other words, she’s hardly a candidate for radical nonattachment. Yet, in Sarah Ruhl’s moving play, that’s just what’s asked of her. Her child, Tenzin (played, somewhat ineffectually, by a small Bunraku puppet and the sixty-seven-year-old actor Ernest Abuba), is recognized as the reincarnation of a revered lama, and the mother, a white American married to a Tibetan man, must decide whether to surrender him to the burgundy-robed monks who want to enthrone him. Ruhl’s work can sometimes be cloying, perhaps a result of her attempt to soften her fierce, questing intelligence. There’s a touch of that here, particularly in a flashback scene, and also a whiff of exoticism. But, under Rebecca Taichman’s direction, what emerges is a poignant piece about love and choice. (Mitzi E. Newhouse, 150 W. 65th St. 212-239-6200.)

The Passion of Crawford

John Epperson’s clever show from 2005 features his drag persona, Lypsinka, dressed as Joan Crawford, lip-synching a full-length interview the actress did with John Springer (Steve Cuiffo) at Town Hall in 1973. Epperson doesn’t have to do much mugging to illuminate Crawford’s bizarre affect (a combination of saccharine and strident, kittenish and cutting), and so the acting, under the direction of Kevin Malony, is surprisingly restrained. The real fun begins, though, after the interview, when a disco ball drops, music starts pounding, and Lypsinka answers a continually ringing phone with random phrases from the interview and from Crawford’s movies. Rather than offering a tribute to the actress, Epperson makes good fun of her. Part of “Lypsinka! The Trilogy,” in repertory with “Lypsinka! The Boxed Set” and “John Epperson: Show Trash.” (Connelly, 220 E. 4th St. 212-352-3101.)

Powerhouse

Sinking Ship Productions presents a portrait of Raymond Scott, a once famous swing bandleader turned electronic-music pioneer, whose music lives on today primarily as the soundtrack to Looney Tunes cartoons. Written by Josh Luxenberg and directed by Jon Levin, this play presents a life story told in fragments, a dizzying and often surreal whirl that’s endlessly inventive in dramatizing Scott’s creative process but which goes all hackneyed when it comes to his personal life. Erik Lochtefeld is an effectively obsessive Scott, but the three supporting male actors end up stealing the show in a madcap subplot tracing the invention of a new cartoon character, while the three women onstage are relegated to thankless roles as Scott’s neglected wives. (Wife No. 3’s signature line: “I brought you a sandwich.”) In this production, stagecraft rules, with the odd result that scene changes and interludes come to life more fully than the human narrative we’re expected to care about. (New Ohio Theatre, 154 Christopher St. 888-596-1027. Through Nov. 23.)

The Real Thing

Poor Henry (Ewan McGregor), in Tom Stoppard’s 1982 play, can’t seem to shut up, not even when his wife, Charlotte (Cynthia Nixon), or his mistress, Annie (Maggie Gyllenhaal), insists that he do so. Henry is a playwright, and Charlotte and Annie are actresses; Max (Josh Hamilton) is Annie’s husband, who acts with Charlotte in Henry’s drama. In this play, Stoppard asks: Are the lives we build with others an illusion, defined by deception? And what does it mean to discover, let alone try to understand, the truth of another person? Gyllenhaal’s and Hamilton’s performances are compromised by McGregor’s lack of interest in Henry’s weaknesses, and they

struggle against the vortex of his movie charm, which the director, Sam Gold, never challenges. Neither Gold nor McGregor can quite excavate the tragedy in Stoppard’s essentially realistic view of love as something that we at once cleave to and reject, especially when we want it most. (Reviewed in our issue of 11/10/14.) (American Airlines Theatre, 227 W. 42nd St. 212-719-1300.)

The Seagull

A remarkable bit of stage alchemy occurs after the intermission of Anya Reiss’s adaptation of the Chekhov classic for Bedlam Theatre Company (in repertory with “Sense and Sensibility”). The first section of the play, while somewhat colloquialized and played in modern dress, is presented traditionally, with the fourth wall intact, and is recognizably Chekhovian. The characters complain of amorous, professional, and philosophical disappointment, and the effect is brittle and a bit forced. After the break, though, the audience comes back to a transformed playing space, to find new seating in a horseshoe surrounding the large table at the center of the stage. Focussing on a series of one-on-one scenes—between Trigorin (Jason O’Connell) and Nina (Laura Baranik), Trigorin and Irina (Vaishnavi Sharma), and Nina and Konstantin (Eric Tucker, who also directs)—the piece achieves a formidable emotional intensity. While you would expect the artifice of acting to be more visible under such close scrutiny, the cast of ten succeeds in revealing deep, non-artificial truths. (Black Box, 18 Bleecker St. 866-811-4111.)

Sense and Sensibility

Bedlam Theatre Company’s realization of the Jane Austen novel (in repertory with “The Seagull”),

adapted by Kate Hamill, who plays Marianne Dashwood, begins and ends with the company’s ten excellent actors paired up and performing a dance that’s part rock and roll and part formal eighteenth-century choreography. The play’s direction, by Eric Tucker (a big-boned Mrs. Jennings here), is itself an evening-long dance, performed in the round, with the actors moving about onstage with a fluidity equal to that of the mobile props—chairs, sofas, tables, doorways—that roll across the playing area in a kind of non-stop allemande of shifting perspectives. The story of social mores, gossip, and hopes dashed and realized is told in scenes splintered and then glued back together. Stagecraft slightly outweighs depth of feeling in this production. (Black Box, 18 Bleecker St. 866-811-4111.)

You Got Older

Freshly dumped, unemployed, and stricken with a nasty rash, Mae (Brooke Bloom) temporarily moves back to her childhood home to help her father (Reed Birney) as he deals with his cancer, finding some relief in vivid sexual fantasies of high-stakes rescues by a fearsomely authoritative cowboy. This terrific new play by Clare Barron, directed by Anne Kauffman for Page 73, offers a hilarious and painfully affecting blend of oddball dialogue, beautifully observed family dynamics, and a preoccupation with the weird ways of the body. In one explosively funny scene, Mae and her three siblings, chattering around their father’s hospital bed, analyze and bemoan “the family smell.” Barron’s special genius lies in the deep dividends she derives from small talk. (HERE, 145 Sixth Ave., near Spring St. 212-352-3101. Through Nov. 22.)

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DANCE

Mikhailovsky Ballet

In its final week at the David H. Koch, the St. Petersburg-based company performs a mixed bill of Russian works, which includes the charming Petipa romp "Cavalry Halt," as well as "Don Quixote." (Lincoln Center. 212-496-0600. Nov. 18-23.)

Complexions Contemporary Ballet

It's been twenty years since Desmond Richardson and Dwight Rhoden formed this company, exploiting Richardson's well-deserved reputation as a virtuoso dancer to promote Rhoden's empty choreography. His pieces are often overdone, superficially sexy, and unmusical; here are two more Rhoden premières: "Head Space," set to recordings by Terence Blanchard, and "The Groove," set to house music from the nineteen-eighties. Marcelo Gomes, a great American Ballet Theatre dancer as yet undistinguished as a choreog-

rapher, offers a work about marriage equality, and on Nov. 20, Gomes's colleague Misty Copeland makes a special appearance. (Joyce Theatre, 175 Eighth Ave., at 19th St. 212-242-0800. Nov. 18-25. Through Nov. 30.)

Lemi Ponifasio / "Birds with Skymirrors"

The Samoan choreographer Lemi Ponifasio was in Micronesia when he encountered birds building nests with videotape. This was the inspiration for "Birds with Skymirrors," a stark spectacle that meditates on climate change. The members of his New Zealand-based company, MAU, ripple their arms in imitation of wings; combine quick, small, gliding steps with chopping arms; and, goggle-eyed, swing glowing orbs, nunchaku style—all to lament the effect of man on the Pacific. (BAM's Howard Gilman Opera House, 30 Lafayette Ave., Brooklyn. 718-636-4100. Nov. 19-22.)

Luke George

For the first part of this Melbourne-based performance artist's latest work, "Not About Face," audience members play ghosts. Or at least they are shrouded in sheets with eyeholes, as George and some cloaked associates cajole them into singing, screaming, huddling, and cuddling. There's talk

of psychic experiences and telepathy. Then the sheets come off and George goes into his dance. (The Chocolate Factory, 5-49 49th Ave., Long Island City. 866-811-4111. Nov. 19-22.)

The Barnard Project

The initiative, now in its tenth year, pairs Barnard dance students with professionals from the downtown dance world. A semester of work leads to a performance at New York Live Arts. For the choreographers, this means a chance to work with larger groups of dancers. For the students, it provides exposure to the ideas circulating in the dance-world trenches. This year's crop includes Patricia Hoffbauer—whose work explores issues of violence and consent—and the ballet postmodernist Pam Tanowitz. (219 W. 19th St. 212-924-0077. Nov. 20-22.)

New Chamber Ballet

The German-born choreographer Miro Magloire sometimes uses music that might be deemed "undanceable," and yet somehow he always manages to find imaginative hidden scenarios in the notes. This evening of new and recent works performed by Magloire's New Chamber Ballet includes music by Michel Galante, Paganini, and Debussy, as well as a solo for the former New York City Ballet dancer Kaitlyn Gilliland, set to Schoenberg's

"Six Piano Pieces," played by Melody Fader. (City Center Studios, 130 W. 56th St. 212-868-4444. Nov. 21-22.)

Ballet Hispanico

For the past three years, the troupe, in excellent shape, has made an enjoyable tradition of heading uptown to the Apollo Theatre during the holiday season. For this visit, the company brings its first full-length narrative: the New York début of "CARMEN. maquia," by the Spanish choreographer Gustavo Ramírez Sansano. The story of the Gypsy seductress, familiar from Bizet's opera, is told through a modernist lens, pairing Bizet's score with abstract, angular dance and black-and-white costumes by the fashion designer David Delfin. (253 W. 125th St. 800-745-3000. Nov. 22.)

Hodworks

Based on what has made it to New York lately, it would seem that nudity and the animal nature of the human body are all the rage in Central European experimental dance. Those are the concerns of this Hungarian company's piece "Dawn," part of a mini-festival of Central European works. As naked bodies come into contact, sliding over one another in repetitive tasks, skin reddens like a sky at sunrise. (Abrons Arts Center, 466 Grand St. 212-352-3101. Nov. 22-23.)

ABOVE & BEYOND

Dvořák's "New World Symphony"

The Czech composer's enthusiasm for America found its musical expression in the exuberance of this beloved work, written in 1893 while he was living in New York. As part of its weeklong celebration of the Velvet Revolution, the Czech Center is flying over the original manuscript—a treasure that normally resides at the Czech National Museum in Prague—to be exhibited at the Czech Center Gallery Nov. 17-21. (Bohemian National Hall, 321 E. 73rd St. czechcenters.cz. 646-422-3399.)

Sam Green: "The Measure of All Things"

Green is an innovative filmmaker who specializes in a self-created medium called "live documentary," which features himself as narrator-lecturer and includes a performance by a band. He began his career utilizing more conventional storytelling techniques, such as talking heads and archival footage, which were employed to remarkable effect in his Oscar-nominated 2003 film, "The Weather Underground." A few years later, he stumbled upon his current format when a friend suggested that he try narrating a troublesome work in progress before a live audience to see if it might help him tie several oblique strands together. Green fell in love with the result, and wound up using it for the finished film, "Utopia in Four Movements," which, along with its live documentary follow-up, "The Love Song of R. Buckminster Fuller," examines the poignant loneliness of utopianism. His latest production, "The Measure of All Things," explores Green's

lifelong fascination with "The Guinness Book of World Records" and includes bittersweet paeans to such record-holders as the oldest living thing (a five-thousand-year-old bristlecone pine) and the woman with the longest fingernails. For the first performance, he will be accompanied by the indie-rock-influenced classical sextet yMusic. The second night's musical guests are a trio, with Catherine McRae on violin, Todd Griffin on guitar, and Brendan Canty on drums; they muster a vast sonic spectrum despite the small lineup. (The Kitchen, 512 W. 19th St. 212-255-5793, ext. 11. Nov. 21-22.)

AUCTIONS AND ANTIQUES

The American sale at Sotheby's (Nov. 20) features three works being deaccessioned from the Georgia O'Keeffe Museum, in Santa Fe, including one of the artist's distinctive flower paintings, the star of many a doctor's waiting room ("Jimson Weed/White Flower No. 1"). Then the house presents two days of Latin-American art, beginning with a trove of Mexican modernist paintings (Nov. 24) from the

holdings of a Mexican industrialist, including works by Rivera, Tamayo, Varo, and Carrington; contemporary Latin-American works go under the gavel on the following day (Nov. 25). (York Ave. at 72nd St. 212-606-7000.) • Christie's rolls out a bevy of American art works—charming scenes by Norman Rockwell, collagelike panoramas by Milton Avery—on Nov. 19, then proceeds to Latin-American art on Nov. 24-25. One of the more intriguing lots in the latter sale is a piece resembling origami, by the Brazilian sculptor Lygia Clark; entitled "Bicho" ("Bug"), the whimsical contraption can be configured in various ways by manipulating its hinged surfaces. (20 Rockefeller Plaza, at 49th St. 212-636-2000.) • Phillips corners the more contemporary end of the Latin-American art market in a sale (Nov. 24) that includes a Murakami-like fantasy ("Untitled") by the Brazilian duo Os Gêmeos, a.k.a. "the Twins." (450 Park Ave. 212-940-1200.) • A first printing of "The Book of Mormon"—the scripture, not the musical—is one of the highlights of Swann's auction of American books and manuscripts on Nov. 25. (104 E. 25th St. 212-254-4710.)

READINGS AND TALKS

Corner Bookstore

The medievalist Paul Strohm reads from his new book, "Chaucer's Tale: 1386 and the Road to Canterbury." (Madison Ave. at 93rd St. cornerbookstorenyc.com. Nov. 20 at 6.)

"The New Salon: Readings and Conversations"

"Poets Out Loud," Fordham University's reading series, and the Poetry Society of America present an evening with the poets R. Erica Doyle and Angela Jackson. (Lowenstein Hall, 12th Floor Lounge, 113 W. 60th St. No tickets necessary. Nov. 24 at 7.)

NIGHT LIFE

ROCK AND POP

Musicians and night-club proprietors lead complicated lives; it's advisable to check in advance to confirm engagements.

Blonde Redhead

This trio, named after a song by the No Wave pioneers DNA, formed in New York more than twenty years ago and earned a central place in the heart of the indie-rock community with its 1997 tour opening for Fugazi. The band consists of Italian twin brothers, Amedeo and Simone Pace, on guitar and drums, and the Japanese singer Kazu Makino, who also plays guitar. A few months ago, the group released a sensual new record, "Barragán," which is softer and less discordant than some of its noisier predecessors. Standout songs, such as the instrumental title track, which features Renaissance-tinged acoustic guitar and warm, analog-sampler-generated flute sounds, and the breathy "Lady M," are marked by an inviting lyricism. (Bowery Ballroom, 6 Delancey St. ticketmaster.com. Nov. 25-26.)

Dave Davies

In North London during the early sixties, a young guitarist, his brother, and a couple of mates started a rock band. Ray Davies, the older sibling, was a brilliant singer-songwriter who would lead the Kinks to the Top of the Pops. Dave, the younger kid, created a distorted guitar sound that defined his band and influenced a host of others, yet he ended up living in his brother's shadow. The pair's legendary flareups notwithstanding, the group thrived into the nineties, until the relationship became untenable. Dave persisted—winningly—as a solo artist. A stroke in 2004 sidelined him, but he returned with a tour last year, his guitar and rock-showmanship chops inspiringly intact. He even has a new album, "Rippin' Up Time." (City Winery, 155 Varick St. 212-608-0555. Nov. 24-25.)

"Kate Loves Bryan"

The sensual, moody, theatrical seventies and eighties musical icons Kate Bush and Bryan Ferry returned to the concert stage this year. Ferry, the former Roxy Music front man, tours regularly, but Bush's London

shows, her first in thirty-five years, were huge events. Joanna Choy, a regular in the Loser's Lounge lineup, wanted to extend the celebration. Bush's song "Violin" struck her as an ode to Roxy Music, and it got her to thinking. "I started drawing parallels," she said recently, "some sonic, some theme-based, and put together a night." Joined by some of downtown's finest musicians and singers, Choy has created a love-letter exchange between complementary artists, augmented with costumes, lighting, and dancers. (Bowery Electric, 327 Bowery, at 2nd St. 212-228-0228. Nov. 22.)

St. Lucia

The South African singer-songwriter and producer Jean-Philip Grobler grew up performing with the Drakensberg Boys Choir School. Later, he studied music at the Liverpool Institute for Performing Arts, in England. Eventually, he wound up writing commercial jingles for a living. Each part of his musical background comes to life in his work with St. Lucia, his Brooklyn-based band. The act's debut album, "When the Night," which came out last fall, is a trove of melodic electro-pop building on pulsing beats, tropical rhythms, and soaring synth-laden hooks capable of filling a stadium. (Terminal 5, at 610 W. 56th St. 212-582-6600. Nov. 19 and Nov. 22.)

TV on the Radio

In 2011, shortly after releasing its album "Nine Types of Light," tragedy struck this inventive indie-rock band when one of its members, Gerard Smith, lost his battle with lung cancer. This week, the group returns with a new album, "Seeds," signalling its continued growth. Abounding with power and strength, the album includes the singles "Happy Idiot," a New Wave-inspired groove, and "Careful You," a fuzzy, burbling oobleckian slice of dance rock. The band marks the coming of "Seeds" with a show at the Apollo Theatre (253 W. 125th St.), on Nov. 18, and a pair of shows at the Music Hall of Williamsburg (66 N. 6th St., Brooklyn), on Nov. 21-22. The composer and vocalist **Natasha Kmeto**, from Portland, Oregon, opens the Brooklyn shows with her layered and soulful songs. (ticketmaster.com.)



The saxophonist and San Juan native Miguel Zenón, whose new album, "Identities Are Changeable," addresses twenty-first-century Puerto Rican life in New York City, brings his quartet to the Village Vanguard.

JAZZ AND STANDARDS

Vinicius Cantuária

The talented Brazilian singer and guitarist moved to New York City in the mid-nineties, and he's worked with Arto Lindsay, Bill Frisell, and many others. He's a seasoned songwriter, whose originals slyly tweak the conventions of bossa nova and Rio pop. He also finds room for classics by Antonio Carlos Jobim—his timeless compositions are the subject of these shows at the Jazz Standard. Cantuária will be accompanied by the pianist **Vitor Gonçalves**, the electric bassist **Paul Socolow**, the percussionist **Dendê**, and the drummer **Adriano Santos**. (116 E. 27th St. 212-576-2232. Nov. 20-23.)

Vincent Herring

Cedar Walton was never a huge star, but as a pianist and composer he was an integral figure on the hard-bop landscape throughout the sixties. He continued performing steadily until his death, in 2013, and Herring, a fearsome saxophonist and longtime Walton associate, leads a quintet that includes the trombonist **Steve Turre** in tribute to the invaluable stylist. (Smoke, 2751 Broadway, between 105th and 106th Sts. 212-864-6662. Nov. 21-23.)

"Music of Joe Henderson"

The late magisterial tenor saxophonist was also a superior composer, and a group uniting Henderson veterans, including the pianist **Renee Rosnes**, the bassist **George Mraz**, and the drummer **Al Foster**, pays tribute to him. They'll be joined by the saxophonist **Jimmy Greene** and the trumpeter **Randy Brecker** to revisit such post-bop classics as "Isotope," "Inner Urge," and "Recorda Me." (Birdland, 315 W. 44th St. 212-581-3080. Nov. 18-22.)

Miguel Zenón Quartet

On his intrepid new recording, "Identities Are Changeable," the charging alto saxophonist, bold composer, and MacArthur-grant recipient takes on the issue of Puerto Rican life in present-day America, making use of a contingent of horns to flesh out his quartet as well as a dense weave of recorded voices sharing personal ruminations. How he approximates its sonic landscape onstage at the Village Vanguard, with the drummer **Henry Cole**, the pianist **Luis Perdomo**, and the bassist **Hans Glawischnig**, will be fascinating to hear. (178 Seventh Ave. S., at 11th St. 212-255-4037. Nov. 18-23.)



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THE TALK OF THE TOWN

COMMENT THE HARDER PART

In the two decades between 1968 and 1988, Democratic candidates lost the Presidency five times out of six. This miserable run forced the Party to move closer to the electoral center on issues from welfare and crime to the role and the scope of government in postindustrial America. In 1992, Bill Clinton, calling himself a “New Democrat,” broke the spell and initiated a two-decade period in which Republican candidates for President failed to prevail five times out of six. (The Supreme Court prevented the country from definitively establishing the result of the 2000 election.) President Obama’s reelection in 2012 devastated Republicans. They reacted, as Democrats had, by asking themselves what went wrong. They wrote earnest opinion pieces, organized soul-searching retreats, formed high-minded study groups, and launched reformist efforts such as the Growth and Opportunity Project, which published a scathing report about the dire state of the Party.

On November 4th, it all seemed to pay off. Political offices around the country, from governorships and state legislatures to Congress, are now decisively red. Even given the Republicans’ advantages in electoral geography and turnout, their sweep should be more chilling to Democrats than the Tea Party triumphs of 2010, because it came in a period of partial economic sunshine, with Republicans statistically less popular than Democrats. The Party that has spent the past six years doing everything in its power to prevent the President from stimulating growth, boosting wages, improving infrastructure, controlling health-care costs, and regulating Wall Street was rewarded with clear majorities in both houses. The only prize left is the big one in 2016.

Republican leaders, determined to prove that they can build as well as destroy, have made a mighty effort not to seem high on victory. “There will be no government shutdowns,” Mitch McConnell, the Senate Majority Leader-elect,

promised. Cory Gardner, the Senator-elect from Colorado, warned, “If Republicans don’t prove that we can govern with maturity, that we can govern with competence, we’ll see the same kind of results two years from now, except it will be a wave going back a different direction.” Senator Rand Paul, a potential candidate for the Presidency, said, “You know, I think the gridlock is going to end.” He sounded like a patient trying to talk his way out of rehab.

There are reasons to be skeptical that the Party has really turned a corner on its chronic obstructionism. Within ten days of the election, McConnell was sounding like himself again. After China and the United States announced common goals for reducing greenhouse gases, he accused Obama of sending “a signal that he has no intention of moving toward the middle”—a place, apparently, where the two parties agree on limitless carbon emissions from coal plants, like the ones in McConnell’s home state, Kentucky. The House Speaker, John Boehner, concurred: “The President intends to double down on his job-crushing policies no matter how devastating the impact.”

The recent, utterly alarming report from the Intergovernmental Panel on Climate Change got through to the Chinese leadership, but not to the G.O.P.’s. The probable next chairman of the Senate Environment and Public Works Committee is James Inhofe, of Oklahoma, who has called global warming a “hoax.” He’s joined in ignorance by Senator Ted Cruz, the ranking member of the Subcommittee on Science and Space, and Senator Jeff Sessions, who will likely chair the Budget Committee. The Republican leadership is determined to prevent or undo any executive action by Obama on greenhouse gases, as well as on immigration reform.

When the Republicans talk about proving that they can govern, they don’t mean that they intend to solve the country’s core problems. The bills that the



leadership has vowed to bring to the floor include corporate tax reform, fast-track trade agreements, construction of the Keystone XL pipeline, and a repeal of the tax on medical devices. Most of these proposals are marginal enough to betray a tactical mind-set: the purpose is not to address important issues but to corner the President with bipartisan votes and improve the G.O.P.'s image ahead of 2016.

In a post-election editorial, the conservative *National Review* dismissed the whole idea that congressional Republicans need to mature, arguing that the “desire to prove Republicans can govern” will only divide the Party between its establishment and its extremists, play into the hands of opponents in the Democratic Party and the media, and perhaps even persuade voters to keep government divided by electing a Democratic President in 2016. The editorial urged the Republican leadership to dedicate itself to one goal: winning the White House—an extension of McConnell’s stated determination in 2010 to make Obama a one-term President. In both cases, the main objective is power. You can hear the voice of the Party’s enablers: why sober up now that the bad behavior is paying off?

A party that dedicated itself to extreme policy positions and a strategy of legislative intransigence won’t find reform easy. Some moderate Republicans studied the résumés of the mid-term candidates and decided that the Party was returning to its

respectable self of the Eisenhower years—the party of Rotarians, prudent business owners, patriotic veterans. This is wishful thinking. That party no longer exists, and neither does the political consensus of the postwar years. It was based on a wide distribution of economic rewards, a high degree of civic participation, and respected national institutions, including the federal government, which the modern Republican Party has done everything it can to discredit (with help from feckless Democratic ideas and actions, not least the rollout of Obamacare).

The fact that there were no rape gaffes from Republican candidates this year doesn’t mean that the Party has moved toward the center. Instead, it has learned how to muffle its extremism. The Growth and Opportunity Project’s withering assessment had no new policies to propose—it seemed wary of the very notion of ideological debate. The report was a strategy plan—a guide to using messaging, polling, technology, fund-raising, and other “campaign mechanics,” in order to reverse the Party’s growing isolation as a bastion of the older, rural, white electorate.

By the standard of the midterms, the report was a success. But building a Republican Party that can entertain ideas and pass laws with far-reaching answers to the country’s problems is harder than winning an election. It might even take losing another one.

—George Packer

THE BENCH MORE BRAINS



John Gleeson, a federal judge in Brooklyn, located an old audio file on the computer in his chambers the other day and clicked Play. It was his way of celebrating a local girl made good: Loretta Lynch, the U.S. Attorney in Gleeson’s courthouse, had just been nominated by President Obama to be the Attorney General of the United States. The voice of John Gotti burst forth from the speaker.

Gleeson, who is sixty-one, has worked at the Brooklyn federal courthouse for most of his professional life. A judge since 1994, he spent much of the previous decade as an Assistant U.S. Attorney for the Eastern District of New York, where he pursued Gotti, the head of the Gambino organized-crime family. In 1986, Gleeson was part of the team prosecuting Gotti on charges of racketeering and other felonies. (Gotti was acquitted. A juror was convicted of selling his vote to one of Gotti’s associates.) The F.B.I. later installed a bug in a secret apartment above

the Ravenite Social Club, in Little Italy, where, on November 30, 1989, Gotti reflected on the chances that other federal charges would be brought against him. The don was weighing whether he might be prosecuted again in the Eastern District, in Brooklyn, or in the Southern District, which is based in Manhattan.

“This motherfucking punk over here. They hate me, them fucking prosecutors,” Gotti says on the recording. “If this is Gleeson again, this fucking rat motherfucker again.”

A bit later, Salvatore (Sammy Bull) Gravano, Gotti’s underboss, says, “I don’t think it’s gonna be by Gleeson.” He adds, “Somebody with more brains.”

“Southern District,” Gotti says.

Gravano agrees. “I think somebody with more brains,” he says. “They don’t want to lose this case.”

The Gambino eminences were voicing an enduring stereotype in New York law enforcement—that the prosecutors of the Eastern District operate as a kind of junior varsity with respect to their colleagues in the Southern District, across the East River. (Full disclosure: this reporter once served as an A.U.S.A. in the Eastern District.) For Gleeson, the nomination of Lynch to run the Department of Justice amounted to vindication for the Brooklyn team. (And Gotti’s prediction

proved wrong. In 1992, Gleeson and his colleagues convicted Gotti in the Eastern District, after Gravano turned state’s evidence.)

“I get the Hertz-Avis reputations of the two offices,” Gleeson said. “But I honestly don’t feel any kind of inferiority complex. Maybe there’s some more humanity over here, some different attitudes. Loretta is a modest prosecutor.” Gleeson noted that Lynch rarely conducted news conferences, which reflected another stereotype—that the U.S. Attorneys in the Southern District display an



Loretta Lynch

unseemly thirst for the spotlight, which is indulged by the press. (Preet Bharara, the current top prosecutor in the Southern District, and such predecessors as Rudolph Giuliani have received a lot more public attention than their Brooklyn counterparts.)

Even before Lynch's nomination, the Eastern District brand was ascendant in Washington. There is already a considerable Brooklyn mafia (so to speak) in prominent positions in the Justice Department. "The reputation of the office has never been better," Gleeson said. Lynch's rise may owe something to the *Zeitgeist* as well. As Gleeson said, "Everyone knows Brooklyn is cooler now than Manhattan. My law clerks all want to live in Brooklyn, but they can't afford it. They have to live on the Upper East Side."

—Jeffrey Toobin

SIDEWALK DEPT. NIGHT OF THE GINKGO



Today in New York—November 13th—leaves are falling, drifting, skittering everywhere. But there is one striking exception: the fan-shaped leaves of the ginkgo are still firmly attached to their branches, even though many of them have turned a luminous gold. One sees why this beautiful tree has been revered since ancient times.

Carefully preserved for millennia in the temple gardens of China, ginkgoes are almost extinct in the wild, but they have an extraordinary ability to survive the heat, the snows, the hurricanes, the diesel fumes, and the other charms of New York City, and there are thousands of them here, mature ones bearing a hundred thousand leaves or more—tough, heavy Mesozoic leaves such as the dinosaurs ate. The ginkgo family has been around since before the dinosaurs, and its only remaining member, *Ginkgo biloba*, is a living fossil, basically unchanged in two hundred million years.

While the leaves of the more modern angiosperms—maples, oaks, beeches, what have you—are shed over a period of weeks after turning dry and brown, the ginkgo, a gymnosperm, drops its

leaves all at once. The botanist Peter Crane, in his book "Ginkgo," writes that, in relation to a very large ginkgo in Michigan, "for many years there was a competition to guess the date on which the leaves would fall." In general, Crane says, it happens with "eerie synchronicity," and he quotes the poet Howard Nemerov:

Late in November, on a single night
Not even near to freezing, the ginkgo trees
That stand along the walk drop all their
leaves
In one consent, and neither to rain nor to
wind
But as though to time alone: the golden
and green
Leaves litter the lawn today, that yesterday
Had spread aloft their fluttering fans of
light.

Are the ginkgoes responding to some external signal, such as the change of temperature or light? Or to some internal, genetically programmed signal? No one knows what lies behind this synchronicity, but it is surely related to the antiquity of the ginkgo, which has evolved along a very different path from that of more modern trees.

Will it be November 20th, 25th, 30th? Whenever it is, each tree will have its own Night of the Ginkgo. Few people will see this—most of us will be asleep—but in the morning the ground beneath the ginkgo will be carpeted with thousands of heavy, golden, fan-shaped leaves.

—Oliver Sacks

THE MUSICAL LIFE PETRI-DISH POP



On a recent Monday, Damian Kulash, the lead singer of the band OK Go, arrived at the Columbia University Medical Center, in Washington Heights, took an elevator to the thirteenth floor, and rode down the hall on his suitcase, which doubles as a foldable scooter. "I got it in Japan," he said. "When I go from Terminal A to Terminal C on this thing, people freak out." Kulash wore aquamarine Converse All-Stars, Mondrian-inspired socks, black sunglasses, and a sweater with "Hello My Name Is" knit-

ted across the chest. He made his way to a genomics lab, where he folded up his scooter. "Whoa, shit!" he said, upon discovering several cages containing black mice. Snapping on a pair of latex gloves, he said, "Never handle music without the proper precautions."

OK Go makes power-pop songs—verse, chorus, bridge, chorus. What sets the songs apart is the way in which they are packaged and promoted. In the video for "Here It Goes Again," a 2006 single, the band executed the choreography on and around eight moving treadmills; recently, for "I Won't Let You Down," it released a Busby Berkeley-esque video featuring more than two thousand Japanese schoolgirls. "We drop a hundred and fifty pounds of confetti during every live show," Kulash said. "If you use enough confetti, you hardly even need to play the songs."

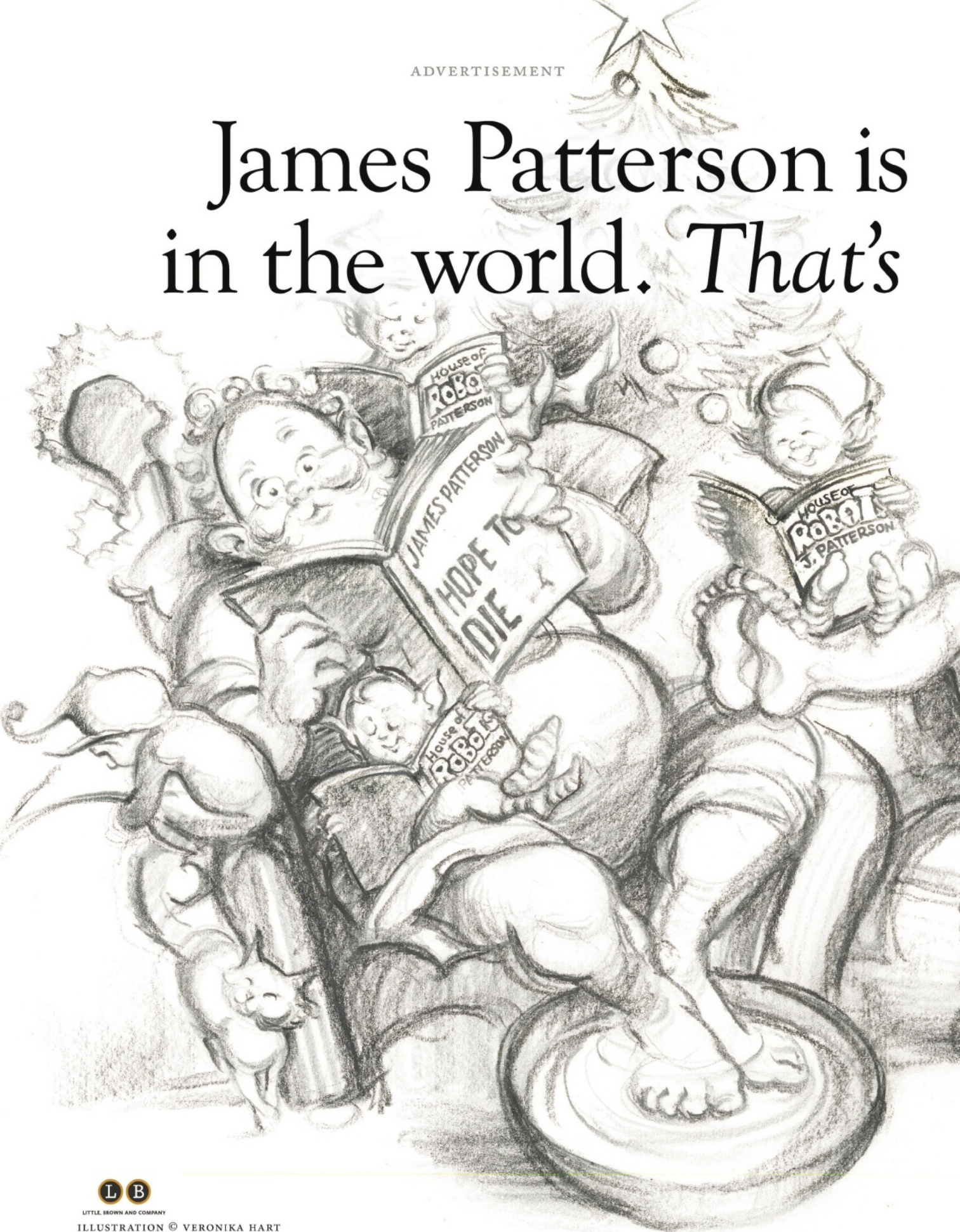
Two years ago, at a conference, Kulash met Sri Kosuri, a biochemist at U.C.L.A. "We are starting to reach fundamental limits of how densely we can store data on microchips," Kosuri told Kulash. "We need new ideas." Given that Kosuri is a biologist, his idea is DNA. "It's information," he said. "Our bodies use it to code for life, but it could be anything." DNA comes in strings of "A"s, "C"s, "T"s, and "G"s; digital files—including music files—are strings of ones and zeros. Translating one code into the other is, for people like Kosuri, relatively straightforward. In 2012, Kosuri converted a book into DNA. Kulash said, "As soon as I heard that they could do this with a book, I went, 'This is how we're putting out our next album.'"

"Hungry Ghosts," OK Go's fourth studio album, was released a couple of weeks ago as MP3s, a CD, and a vinyl record. Later this year, it will be released as DNA. "Legally speaking, it's unclear whether we will be able to sell the DNA to anyone, or how we would physically get it to them," Kulash said. "This stuff is regulated really fucking heavily." In theory, an OK Go fan would receive a small plastic vial containing a few drops of water. Dissolved in the water would be a few nanograms of DNA containing around a hundred thousand copies of "Hungry Ghosts." "Obviously, it's an artistic gesture and a scientific project, not the most efficient way to actually buy our album," Kulash said.

He was visiting Columbia to see how a fan might convert nucleic acid into

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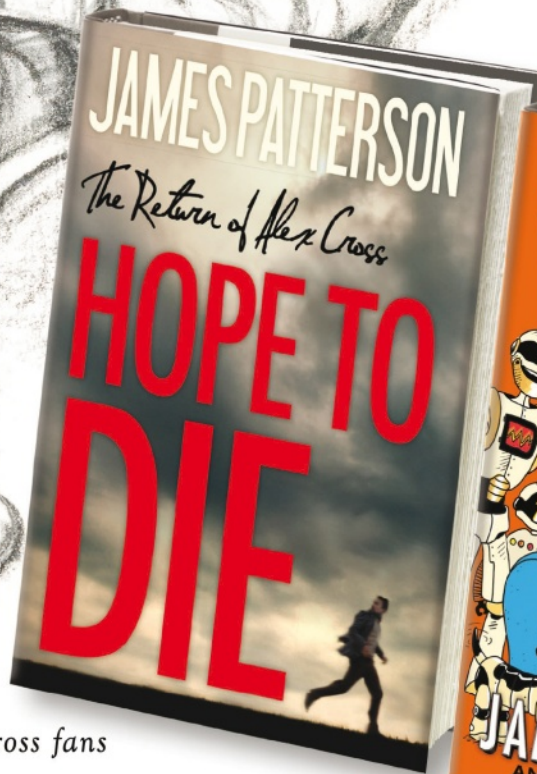
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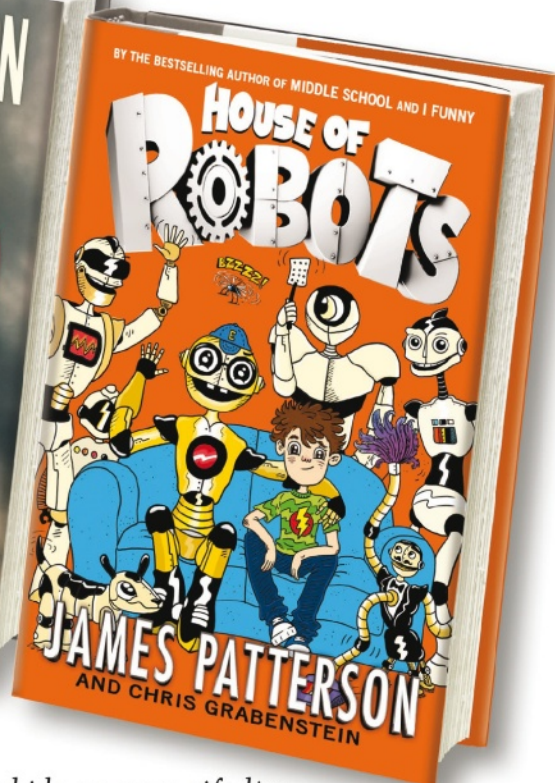
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digital songs. He asked Harris Wang, a biologist in the lab, “If I’m turning DNA into music, what happens first?”

Nathan Johns, a graduate student, removed from a refrigerator a plastic vial of green-tinted solution bearing the DNA. The OK Go DNA was still being prepared, so he demonstrated on another batch. Using a pipette, he deposited three drops of the solution into a gel and slid the gel into an electrophoresis machine.

“This will tell us how many base pairs of DNA are in our sample,” Wang, who is thirty-one and wore rimless glasses, said. “And the purpose of that is what?” Kulash asked. “To make sure the sample isn’t fucked up?”

“Um, sure, you could say that,” Wang replied.

Johns loaded the gel into a Bio-Rad Molecular Imager. “Thank you for aptly naming yourself, machine,” Kulash said. “You are, in fact, rad.”

Wang described the next step: heating and then cooling the DNA, causing it to replicate.

“So you heat them up and they’re, like, ‘Fuck that!’” Kulash said. “And then you cool them down and they’re, like, ‘Oh, this is comfortable. Let’s hang out for a while,’ and then you heat them up again and they freak out—is that basically how it works?”

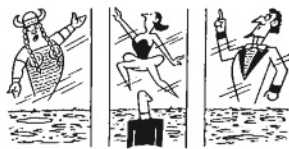
Wang nodded hesitantly. “It’s an exponential amplification,” he said. “If you run it fifteen times, you get into the millions of copies.” He continued, “At this point,

you would send the sample off to be sequenced, and it would come back as a readout—A, G, C, G. That’s your code, and you then convert that into a song.”

“That is so fucking cool,” Kulash said, dropping into a rolling chair. “So, if we sell just one or two water droplets, we’ll have the highest-selling album of all time.”

—Andrew Marantz

THE BOARDS POSTER BOY



Over the decades, the Public Theatre, on Lafayette Street, has launched many a big show. Last week, the organization turned the lobby of its Newman Theatre into a permanent collection of the Public’s longest-running hit: the posters of Paul Davis, which during his sixteen years of collaboration with the theatre’s founder, Joe Papp, changed the face of theatrical-poster display.

Davis, a droll seventy-six-year-old Oklahoman with a helmet of silver hair, stopped by the other evening to survey his work. When Papp hired him, in 1975 (on the strength of Davis’s wallop of a poster of Che Guevara, done for *Evergreen Review*), the theatrical ad was a wan genre. “Everything was just typography and credits,” Davis said. “The theatre poster

was actually designed by agents representing the artists and the lawyers.” He resolved to communicate, in his posters, “a sense of what the actors and the director were trying to do.”

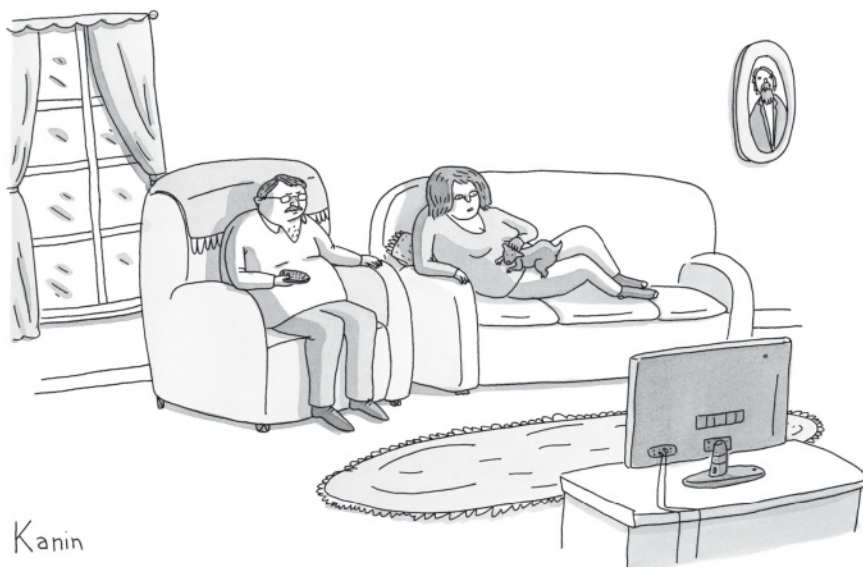
In Davis’s hands, the posters themselves became an event. At one point, in 1976, his posters for four different shows—“The Threepenny Opera,” “Streamers,” “for colored girls who have considered suicide/when the rainbow is enuf,” and “Hamlet”—were plastered in the subways. “It was incredibly colorful,” he recalled. “It was only then that everyone began to realize that we were branding the theatre.” Milton Glaser, the graphic designer, says of Davis’s posters, “They create a very special excitement. His work is volumetric—sort of rounded and full; in the Renaissance sense, it’s fully rendered.”

The exhibit is dominated by Davis’s iconic three-sheet portrait of Papp—half maverick, half riverboat gambler, all charmer—with his coat collar turned up and a cigar in his right hand. “I remember him saying, ‘I think I’m the only single-name producer left. Every other show has six names at the top,’” Davis said. “He was very proud of that.”

The Public’s collection includes studies of Meryl Streep, Denzel Washington, Irene Worth, Sam Waterston, and Kevin Kline, who did “Hamlet” twice at the theatre. Davis worked mostly from photographs that he took at his studio. “With Kevin, he would actually come over and do an hour of ‘Hamlet’ while I photographed him,” Davis said. In the poster for “The Threepenny Opera,” Raúl Julia’s gloved hand rests on a cane that runs off the edge of the image, lending a hint of menace; in “Caroline, or Change,” Tonya Pinkins, the eponymous sour maid in Tony Kushner’s musical, sits smoking, with her arms crossed in forlorn solitude. “When I showed it to the ad agency, they said they wanted her to be more cheerful,” Davis recalled. “Kushner said absolutely not, and saved it.”

Davis grew up a preacher’s son, and working with Papp, he said, felt “very familiar to me.” He regards the Public as a “sacred space, a place where you could bring up important issues. Instead of running one service a week, Joe was running thirty or forty performances.” He added, “It was like my childhood all over again.”

—John Lahr



Kanin

“At some point, there’s only so high you can raise the volume before you admit you’re never gonna understand what British detectives are saying.”



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This summer, Google, Apple, Facebook, Twitter, and other Silicon Valley superpowers released demographic reports on their workforces. The reports confirmed what everyone already knew: tech is a man's world. Men make up sixty to seventy per cent of employees at these companies, and, notwithstanding rock stars like Facebook's Sheryl Sandberg and Yahoo's Marissa Mayer, senior leadership is even more overwhelmingly male. A recent study by the law firm Fenwick & West found that forty-five per cent of tech companies there didn't have a single female executive. (The picture is also bleak when it comes to ethnic diversity.) The Valley seems to take the problem seriously—Apple's Tim Cook recently stated his commitment to “advancing diversity”—but there's a long way to go.

A familiar explanation for tech's gender disparity is the so-called pipeline problem: the percentage of female computer-science graduates has almost halved since the nineteen-eighties. But this doesn't fully explain why there are so few women in senior management or on company boards (where skills other than programming matter). Nor can it explain the high rate of attrition among women in tech. A 2008 study found that more than half of women working in the industry ended up leaving the field. The pipeline isn't just narrow; it's tapering.

Tech companies may pride themselves on being meritocracies, but unconscious biases shape the way they hire and promote. Such biases can be tremendously powerful. A 2012 study asked top research scientists to evaluate job candidates with identical résumés. The scientists judged female candidates to be less capable than male ones, and suggested significantly lower starting salaries for them. Even more striking was a 2005 experiment in which participants evaluated applications for a job as chief of police, scanning résumés that indicated varying levels of formal education and on-the-job experience. A male candidate who had less schooling would be credited with street smarts, but a woman with an identical résumé would be dismissed for not having enough education. When the qualifications were flipped, so was the justification for hiring the man. The hirers were really just rationalizing a gut decision about who was right for a traditionally male job.

Techies have been around a lot less long than police chiefs, but they have an entrenched gender profile, too. Joan Williams, a law professor at the University of California, Hastings, and co-author of “What Works for Women at Work,” told me, “Even though it's a job that basically involves

sitting at a typewriter, there's a real emphasis on the idea that these are jobs that only a real man can do.” The result is a Catch-22: women need to act “masculine” to fit in, but get labelled as difficult and pushy if they do. In a recent study of almost two hundred and fifty performance reviews, the tech entrepreneur Kieran Snyder found that three-quarters of the women were criticized for their personalities—with words like “abrasive”—while only two of the men were.

Subverting these biases requires more than training. Instead, companies should be looking for what Williams calls “bias interrupters”: systems that identify bias and intervene to mitigate it. For instance, until the nineteen-seventies classical-music orchestras were almost entirely male. Once blind auditions were introduced, the percentage of women quintupled. A startup called Unitive is designing software to do similar work. The software forces recruiters to decide what characteristics they value most, and rank blind résumés according to a series of criteria. It also helps companies design interview

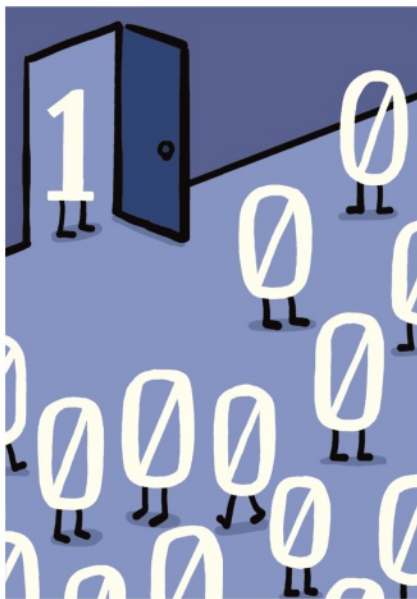
questions that are carefully tailored to job requirements. The hope is that this will mitigate what Laura Mather, Unitive's founder, calls the “‘I just don't want to hang out with this person’ problem.” Google, similarly, now requires interviewers to ask every candidate for a given job the same questions, so that bias doesn't shape what gets asked.

Promoting diversity isn't, as many techies think, pure do-gooderism. It's genuinely good for business, since a large body of evidence suggests that making organizations more diverse can also make them perform better. A recent McKinsey study found that the organizations with the most diverse executive teams had dramatically higher returns on equity and earnings performance than those with the least diverse teams.

A study of investment clubs by Brooke Harrington, a professor at Copenhagen Business School, revealed what she called a “diversity premium”: groups made up of both men and women outperformed single-sex ones. A worldwide study, published in May, of more than four thousand R. & D. teams found that gender-diverse teams were considerably better at driving “radical innovation.”

The snag is that, while diverse groups perform well, they can be harder to manage and more challenging to work in than homogeneous ones, precisely because diverse perspectives lead to more disagreement and conflict. So even when the results are better people are less happy with the experience. To fix this, you have to consciously reshape how people deal with one another, and that entails some cultural disruption. But it's a price worth paying. Now that tech companies have evolved into consumer-electronics and social-media giants, their customers come from every demographic group imaginable. It's time their workers did, too.

—James Surowiecki



The Siemens logo is displayed in a bold, teal, sans-serif font. It is positioned in the upper left corner of the advertisement, set against a white rectangular background that has a thin blue horizontal line below it.

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The background of the advertisement is a photograph of a rural Iowa landscape. In the foreground, there is a field of dry, harvested corn. In the middle ground, a white two-story farmhouse and a large white barn with a red lower section are visible. Two large white wind turbines are situated in the background, one on the left and one on the right, both with their blades pointing towards the right. The sky is a clear, bright blue with a few wispy white clouds.

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AMERICAN CHRONICLES

THE PROGRAMMER'S PRICE

Want to hire a coding superstar? Call the agent.

BY LIZZIE WIDDICOMBE

Not long ago, Stephen Bradley, a New York tech entrepreneur, was looking to expand his company, AuthorBee, which aggregates tweets and Instagram posts and puts them together in story form. Instead of following people, readers can follow their interests—"Breaking Bad," for example, or the New England

write the code that would form AuthorBee's DNA. The guys in Pakistan and Bangladesh were O.K., but the cultural differences and the language barriers slowed things down. He needed "one really good developer" with a mastery of all the coding languages and frameworks that AuthorBee uses: Python, Django,

ing to set up a "short online telephonic meeting." "I could have had two hundred résumés on my desk," Bradley said. But he knew that the people behind those résumés weren't the ones he was looking for. His dream developer might be buried in there somewhere, but Bradley had come to think that developers were like social media itself: "Ninety-nine per cent of them suck." He added, "The entire problem is wading through the noise."

Finally, Bradley received an e-mail from 10x, a talent company. 10x was started by two music and entertainment managers, Michael Solomon and Rishon Blumberg, who for the past nineteen years have represented rock stars, including John Mayer and Vanessa Carlton. Re-



The agency 10x has nearly eighty clients, mostly in North America, though one codes from India and one from beaches in Thailand.

Patriots. Bradley is not a stereotypical startup founder, a hoodie-wearing college dropout; he's been working in tech and media for decades. To launch AuthorBee, he raised three-quarters of a million dollars from angel investors and hired programmers in Pakistan and Bangladesh to build a prototype. Now he wanted to build a bigger, better version of the site, so he had to find someone to

Angular, JavaScript, the Twitter A.P.I. The search for programming talent was the part of building a startup that Bradley most dreaded. "It is a nightmare," he told me. "And I'm as plugged in as you can be to the New York tech scene."

He put up a job posting on the Web site AngelList, and was immediately flooded with calls from headhunters and e-mails from offshore companies want-

cently, in the wake of the digital revolution and the music industry's implosion, Solomon and Blumberg have begun serving as agents for technologists. 10x claims to represent digital "rock stars"; the company's name comes from the idea, well established in the tech world, that the very best programmers are superstars, capable of achieving ten times the productivity of their merely competent colleagues. In

“
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HBO's "Silicon Valley," a self-effacing character named Big Head compliments his friend's coding skills by saying, "Richard's a 10xer. I'm, like, barely an xer."

Computer programmers with agents: Bradley was interested. So one day last month he found himself in the 10x headquarters, in midtown Manhattan, talking to Michael Solomon. Solomon has a rock-and-roll vibe: he wore jeans and a metal bracelet, and he projects a mellow air. His office was decorated with guitars, gold and platinum records, and posters signed by Green Day and Bruce Springsteen.

Bradley asked about 10x's talent pool: did it really include "the top developers in the world," as Solomon claimed?

Solomon dropped technological achievements the way one might talk about album sales or duets with Lady Gaga. He said that one of his clients had overseen user-experience design for Apple's iCloud. "Have you heard of Django?" he added. Django is a framework that was used to build Instagram. "The guy who co-created Django is a client."

Bradley was impressed.

"What's your stack?" Solomon asked, referring to the layers of code that make up a Web site.

Bradley ran through the various languages and features with which the site was built. "It's all running on Amazon," he said, meaning the company's cloud-computing service.

Solomon leaned back in his chair and flipped through a mental Rolodex of his clients. "I definitely have some ideas," he said, after a minute. "The first person who comes to mind, he's also a bioinformatician." He rattled off a dazzling list of accomplishments: the developer does work for the Scripps Research Institute, in La Jolla, where he is attempting to attack complicated biological problems using crowdsourcing, and had created Twitter tools capable of influencing elections. Solomon thought that he might be interested in AuthorBee's use of Twitter. "He knows the Twitter A.P.I. in his sleep."

"What kind of price range are we talking about?" Bradley asked.

"Ballpark, for this role you're talking a hundred and fifty to two hundred and fifty dollars an hour."

The rate was significantly higher than what Bradley had paid the workers in Pakistan. (Offshore developers charge as little as twenty-five dollars an hour.) But

Bradley decided the upgrade was worth it. "And that includes your fifteen percent?" he asked.

Solomon said that it did, and they shook hands.

The world is being rebuilt in code. Hiring computer engineers used to be the province of tech companies, but, these days, every business—from fashion to finance—is a tech company. City governments have apps, and the actress Jessica Alba is the co-founder of a startup worth almost a billion dollars. All of these enterprises need programmers. The venture capitalist Marc Andreessen told *New York* recently, "Our companies are dying for talent. They're like lying on the beach gasping because they can't get enough talented people in for these jobs."

The computer science taught in colleges still focusses more on theory than on commercial application; the business of teaching practical coding skills has the whiff of trade school. So-called coding "boot camps," such as General Assembly, founded in 2010, are trying to fill the gap, teaching crash courses in how to design Web sites and write code. But Jake Schwartz, the co-founder and C.E.O. of General Assembly, told me, "There's simply not enough senior people in the system."

In Silicon Valley, where businesses are fuelled by venture capital, the "talent wars" have reached epic proportions. Andreessen said, "The motivation to go find talent wherever it is is unbelievably high." The Google campus is famous for its playful amenities: nap pods, ball pits, massages, dry cleaning, all-you-can-eat buffets. Facebook recently announced that it would pay for its female employees to freeze their eggs. The "precaution"—a sabbatical before starting a new job—has become commonplace.

The biggest companies frequently get into bidding wars over the best talent. Twitter's senior vice-president of engineering, Christopher Fry, was paid more than ten million dollars in stock options in 2012, second only to what the C.E.O. received. To prevent a programmer from defecting to Facebook, Google paid him three and a half million dollars in restricted stock options. Facebook has also become known for the "acqui-hire": paying millions of dollars to acquire a company in order to poach its tech talent. The

company gets shut down, and the engineers work for Facebook.

Startups don't have the money to compete with the giants. They can offer equity, but, Bradley said, "the market's flooded with startups trying to do the same thing." Plus, the most desirable developers—those with creative skills—often have entrepreneurial ideas of their own. "In their minds, you're not just paying them to do their job," one tech executive told me. "You're paying them for the opportunity cost of not becoming Mark Zuckerberg." In response, many startups have devised offbeat measures for luring candidates: offices that resemble a Chuck E. Cheese's, with a music room (at Dropbox) and an indoor tree house (at Airbnb). Scopely, a mobile-game publishing company, rewards a new hire—or anyone who can deliver one—with eleven thousand dollars wrapped in bacon, an oil portrait of himself, and a harpoon gun.

All this may seem ludicrous, but, given how much money is sloshing around in the system, some people argue that the best technologists could be getting even more from their employers. Todd McKinnon, the C.E.O. of Okta, a cloud-computing company, told me that top engineers are worth "way more than what we're paying them." A good office worker might generate two or three times the revenue of a mediocre one, but, he said, "you could have a good engineer who'll come up with an algorithm that will support ten million people, or a great engineer who'll come up with an algorithm that supports a *billion* people. You've just 1,000x-ed the revenue for your company." In Silicon Valley, the average engineer's salary is around a hundred and thirty thousand dollars a year, according to a recent analysis by the Brookings Institution—cheap, when compared with the potential profits. Apple makes more than two million dollars in revenue per employee each year. Google makes almost sixty billion dollars in revenue annually. "Google has ten thousand engineers. So they get people's dry cleaning, which costs them a couple of thousand dollars a year," McKinnon said. "That's nothing!"

Enter the agents. Solomon describes himself as an equalizer. In creative industries, he told me, "there's always this pattern that the creatives start out at the bottom of the food chain and are exploited." In the early years of recorded music, label

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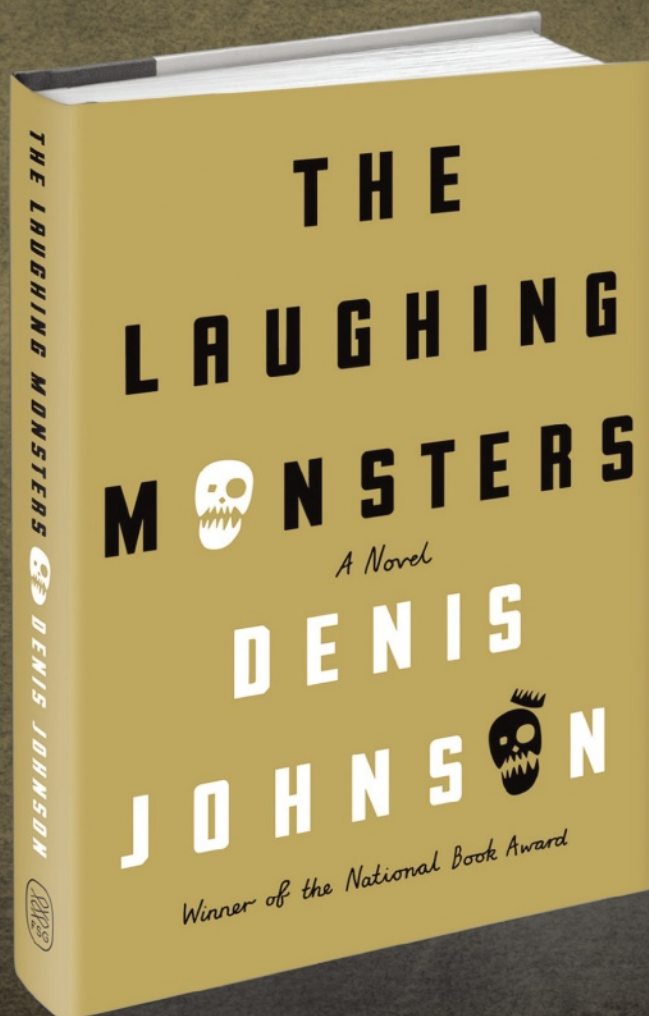
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—Boris Kachka, *New York*

"RADIANT." —Laura Miller, *Salon*



Tech companies can't always be trusted to look after their employees' interests, either. In 2010, a group of tech employees filed a class-action suit against a group of Silicon Valley giants, including Apple, Google, Intel, and Adobe, charging that between 2005 and 2009 the heads of these companies suppressed pay by agreeing not to poach one another's employees. In March, 2007, Steve Jobs forwarded to Eric Schmidt a recruiting pitch that a Google employee had e-mailed to an Apple engineer. "I would be very pleased if your recruiting department would stop doing this," Jobs wrote. The recruiter who sent the e-mail was fired, and Schmidt berated his human-resources department, writing, "We have a policy of no recruiting from Apple." Several of the companies,

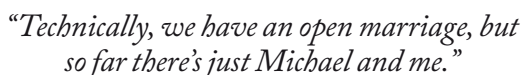
Solomon and Blumberg have been friends since elementary school. In 1995, they started a company called Brick Wall Management. They had a solid roster of clients, but Solomon grew disillusioned with the music business, where “every conversation was about how bad things were, who’s getting laid off, who’s going under,” he said. Solomon is the “idea guy” in their partnership, with an entrepreneurial streak. Besides music management, they did V.I.P. ticketing for Bruce Springsteen shows and started charities. Solomon said, “There was a little part of us that felt like, since tech was a big part of eating the music industry’s lunch, let’s go make some money there.” They came up with two ideas for apps. One was a digital boxed set, to be sold on iTunes. In addition to an artist’s albums, it would give you “extensive liner notes, photos, videos”; you could also record karaoke versions of your favorite tracks. The other was a series of set-list apps. If you were at a Bruce Springsteen concert, Solomon said, “you could say, ‘Oh my God, he just played “Candy’s Room.” When was the last time he played that?,’ ” and your phone would tell you.

of freelance Web developers. One of the experiences “was a bit of a disaster,” Solomon said. The developers completed ninety per cent of the boxed-set app, but, when they ran into problems with the karaoke feature, they went AWOL. “They stopped responding to e-mails for weeks at a time,” Solomon went on. “We were saying to ourselves, ‘Gosh, who do we call? How does the world operate like this?’” Solomon had also been struck by the developers’ lack of business savvy: when he hired them, they didn’t negotiate; they just took the first offer. He and Blumberg realized that they were dealing with “a really familiar personality type”: talented people with zero business skills. “We were, like, ‘This is a musician! This is what we’re used to!’ That was the light-bulb moment,” Solomon said.

Recruiters are the traditional middlemen of tech; companies hire them to fill openings. But the profession doesn't have a good reputation among technologists: the promise of easy money, combined with a low barrier to entry, means that it's full of "pikers," as one recruiter told me—opportunists who treat the talent search like a truffle hunt. Recruiters generally don't have backgrounds in tech. Instead, they're competitive types, jocks pursuing nerds. A blog called *Shit Recruiters Say* features excerpts from ham-handed recruiter e-mails. David Hansson, the creator of the programming framework Ruby on Rails, once published an e-mail he'd received from a recruiter from Groupon "looking for folks with solid skills."

For short-term projects, consulting firms and so-called “dev shops” employ engineers, taking a cut of their hourly rate. But freelancers aren’t always happy with the arrangement. One developer I spoke with told me, “I can think of at least one notable consulting company that bills two hundred and fifty dollars an hour and pays their people less than a hundred.” Another complained that the system is too impersonal: “We call them ‘body shops,’ because they are just hired to fill up a project with warm bodies.”

Solomon and Blumberg decided that they wanted to align with—and to be paid by—the programmers rather than with the companies doing the hiring. But to get clients they needed an entrée into the tech community. They found one in Altay Guvench, a 2003 Harvard graduate and an





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engineer who is also a musician. His band, the Great Unknowns, once toured with the Indigo Girls.

Guvench took a circuitous route to programming. He ran a recording studio in college, and then got involved with a startup that attempted, he says, to “disrupt the marketplace for live touring.” The company failed, and Guvench recognized that the problem was on the tech side: “We had a co-founder who’s this brilliant coder but was more excited about computer-science problems than about business problems. He was coding in this obscure language.” In 2006, Guvench moved back to his home town of Falmouth, Maine, and began living in his parents’ basement. He

couldn’t bring himself to find a new job. “I’d failed pretty hard and was recovering,” he said. He decided to teach himself computer programming, starting with the languages that make up the “front end” of a Web site—the things that you see in your computer browser: HTML, CSS, JavaScript. Guvench found that programming’s intricacies reminded him of music. “I’d always been a nerd, so I took to it,” he said. He landed a job coding for L.L.Bean’s Web site, and began teaching himself Ruby on Rails at night. “It’s quite a rabbit hole,” he said. “There’s always something new to learn.”

Guvench met Solomon and Blumberg through a charity that Solomon started, called Musicians on Call, which brings music to the bedsides of sick people. By then, he had moved to California, and worked as a freelance programmer for several years, playing music on the side. But he was tiring of his new life. He wasn’t good at selling himself, or at billing clients. “Like many freelancers, I liked building stuff,” Guvench told me. “All that other stuff”—the business—“seemed like a necessary evil.” When Guvench met Solomon and Blumberg, he had been approached by a company that made pharmaceutical software. He recalled, “I was, like, ‘Why don’t you try to negotiate my contract?’” Guvench briefed Solomon on the terms he wanted. Guvench said, “Twenty minutes later, he called me up and was, like, ‘Here’s what we got.’ The money was better. He raised my rate fifty per cent. I

was charging a hundred dollars an hour, and he got me up to a hundred and fifty.” The agents also took care of his contract and handled invoicing. After a few months, Guvench noticed that his life style had changed: “I was getting paid more, and I was doing less grunt work. My friends started saying, ‘How do I get an agent?’” He called up Solomon and Blumberg and said, “I’m done being your client. I want to be your business partner.”

Guvench and I were having this conversation in San Francisco, where he lives; his home is 10x’s West Coast office. He’d asked to meet at a coffee shop run by the Long Now, a nonprofit that tries to foster creative thinking for “the next 10,000 years.” It was decorated with a mechanical model of the solar system and a digital painting by Brian Eno. “I like this place, because clearly they love technology, but they’re taking a measured approach to it,” Guvench said. He is burly but gentle, with a closely shaved head, a short beard, and an eyebrow piercing. He describes himself as a “techno-hippie.”

10x now has almost eighty clients. Though they are mostly in North America, one lives in India, a handful are in Israel, and one codes from beaches in Thailand. The roster includes only three women, which Solomon said he is “bummed” about. 10x works mostly with freelancers, which Guvench told me is a strategic choice. “This aligns our incentives,” he said. “If we don’t keep the talent happy, they stop working with us, and we go out of business.”

The three partners have separate roles. Blumberg handles his and Solomon’s eleven remaining music and entertainment clients, and takes care of back-office matters: “Accounting, invoicing, collection, payouts. Everything that’s the bane of most people’s existence.” Guvench vets new talent. Potential clients have to fill out a questionnaire that one programmer compared to “the most complicated dating Web site ever.” Then Guvench and Solomon conduct interviews, to screen for communication skills. (I heard one potential client say, during a meeting in Solomon’s office, “We don’t want people who just write code and drool.”) Guvench also does code re-

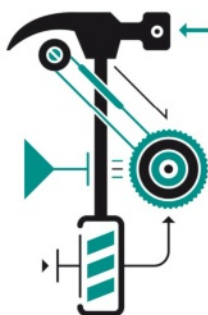
views—testing Web sites that aspiring clients have built, and reviewing the programs they’ve written.

Code can be “elegant,” Guvench said, but it’s not a poem—it’s a set of instructions to a computer. He doesn’t consider himself an expert in many programming languages, but, he said, “I’m really skilled at jumping into things and getting to the ninety-per-cent mark.” When he’s reviewing code, he looks for several things. The first quality of good code is that it’s “readable—both by computers and by humans.” Humans, after all, might have to fix it at a later date—when it crashes and there are thousands of angry customers on the phone.

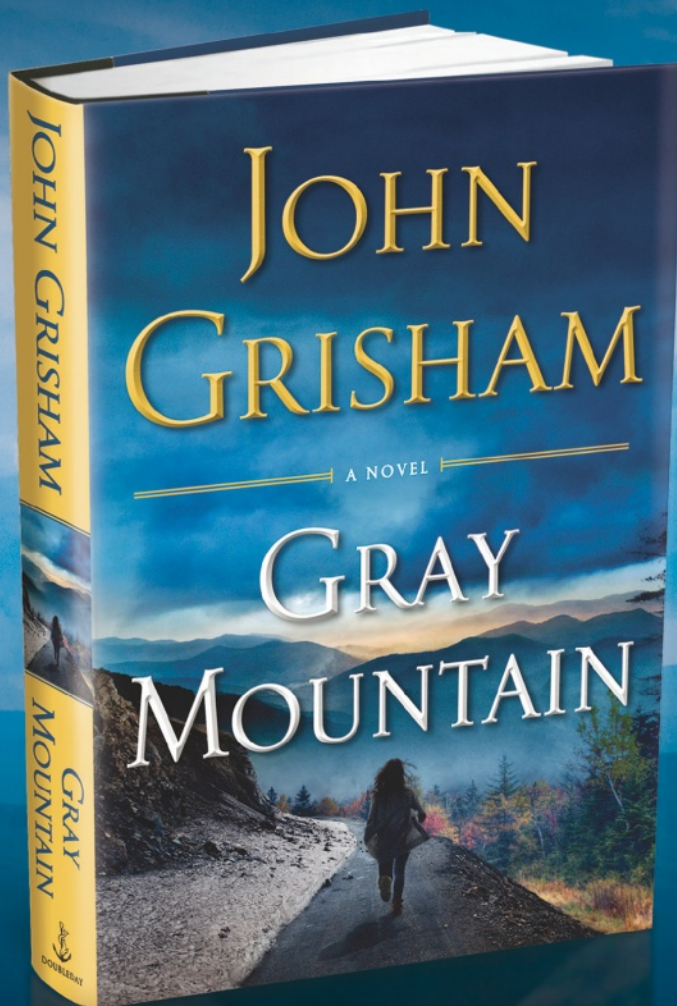
He also looks for concision. “There’s a programming principle called DRY,” Guvench said. “Don’t Repeat Yourself.” A bad programmer might copy and paste a command—“Make this wiggle”—a hundred different times. But a good programmer would turn the command into a handy little function. If a line of code looks repetitive, Guvench told me, “people will say, ‘The code smells.’”

Good code also works fast. Say you have a spreadsheet with hundreds of voter names, and you want to check each name against a cache of data and assign people to parties—Republican or Democrat. “A bad programmer might write a function that makes a hundred different ‘calls’ to the database,” Guvench said. I could almost see the dreaded spinning beach ball on the screen. A good programmer would find a more efficient way, or “hack.” “He could write a function that would just ask the database one question: ‘Give me these hundred people, along with this data about them.’”

Guvench said he was surprised to find that he likes being an agent. He’s discovered that he’s a “nerd whisperer.” Since he started, 10x has managed to sign a number of high-profile freelancers. Adrian Holovaty is the client who co-created Django. John Coggeshall, a core contributor to a programming language called THP, signed with 10x after reading about it on Slashdot. He’s based in Detroit, and said that the agents have connected him with other specialists who “make my life easy.” “From Day One, they provided awesome value,” he said. Greg Sadetsky, a geo-mapping specialist in Canada, co-founded a company that was bought by Apple. He said that



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Guvench gives him the feeling of “talking shop with someone who knows.”

“I think I have a knack for finding people who are better than I am and getting them to like me,” Guvench said. He doesn’t mind doing business deals anymore: “It turns out that negotiating is a lot easier when you’re doing it for someone else.”

For 10x’s clients, Guvench said, “part of our goal is to de-risk freelancing and make it more viable.” Short-term work tends to be feast or famine, so 10x agents spread projects around, to accommodate their clients’ life styles. The client in Thailand, Greg Jorgensen, works as a “code doctor”—he specializes in fixing old, broken code—and the rest of the time he travels and scuba dives. Jorgensen told me that he now takes impromptu trips to nearby islands, coding for a few hours each day from a hotel room. “After thirty-five years of cubicle jobs, this is a huge improvement,” he said.

For its customers—especially the non-technical ones—10x provides access to specialists a Facebook executive might have on speed dial, as well as someone to talk to if problems crop up. Camille Kubie, who runs a design and branding agency, hired 10x developers to create a Web site for a large health-care company. She said the 10x programmers “knocked it out of the park” when it came to coding. She also appreciated that they had been vetted for interpersonal skills. At one point, they had to speak directly with the health-care company’s New York offices. “They were good,” she said. “And it wasn’t embarrassing to let them out of their cave.”

There are a few companies offering services similar to the ones that 10x provides. HackMatch, started by a twenty-one-year-old named Dave Fontenot, helps engineers find startups to join. Fontenot told me, “I’m consistently able to place people for a hundred thousand dollars plus, straight out of college.” A company called OfferLetter.io helps engineers negotiate, and Hired.com lets them market their services, employing “talent advocates” to help them polish their profiles.

In San Francisco, Guvench and I had finished our coffee. It was a cold, foggy day. We walked to Guvench’s home, in the Marina District, to meet some of 10x’s clients. Guvench lives in a “hacker

mansion,” a large Italianate house called Sugar Magnolia, because it is owned by a former Deadhead. The living room was littered with instruments: guitar, cello, electric bass, drums, saw, banjo, upright bass. But Guvench’s roommates weren’t home. Instead, we were greeted by a group of polite young men: the talent.

Rock-star developers are, not surprisingly, very different from actual rock stars. Solomon told me, “Generally speaking, the egos are the opposite.” Programmers tend to undersell themselves. (One potential client described himself as “pretty fast”; it later emerged that he’d won a speed-coding competition in India.) Solomon surmised that this has to do with the nature of feedback in the two professions. If you put a product in Apple’s app store, your interaction with customers consists mostly of anonymous griping. Meanwhile, he said, “even a low-level musician is onstage playing to fifty people, and after that show they have ten people who come up and tell them, ‘Dude, your song saved my life!’”

But there are similarities, the agents said, including the late hours and the drug of choice (marijuana). And, like actual rock stars, rock-star developers come in a range of personality types. Guvench had briefed me at the coffee shop: front-end guys—designers and user-interface engineers—make products that interact with what he referred to as “normal” people. As a result, “they’re sort of hip,” he said. “Especially designers—they dress nicely.” The further you get down the “stack,” Guvench explained, “the more . . .” He paused. “‘Neckbeard’ is the word that comes to mind.” Back-end engineers, like data scientists and system administrators, “are the most brilliant people,” he said. “They may not be the most fun to talk to at a party, but they’re really fucking good at talking to computers.” Of course, he added, the stereotype doesn’t apply to his clients.

“Do you want a drink?” one of the 10xers asked, and they all introduced themselves. First came the aesthetes: Shawn Feeney, who has bright-blue eyes (in terms of rock stars, he looks like Billy Corgan), does Web, app, and logo design. “I also do freehand vegetable carving,” he said. He’s a world-renowned pumpkin carver, who’s in the Guinness Book of World Records for Largest Fruit Sculpture. He has carved jack-o’-lanterns for

George Lucas and the White House. Andrew Price and Matt Wood, who are part of a three-person team called Arsenal, looked like geeky lumberjacks, in flannel shirts and work boots. They are user-interface specialists, who worked on Shopping Express, Google’s FreshDirect competitor. In their spare time, they make furniture. Todd Siegel is an iOS developer—he designs and creates prototypes for mobile applications. Tall and shy, with a baby face and a few long, dark strands of hair swept to one side, he runs a poetry-reading series. “I’m kind of a wordsmith,” he said.

Then came the back-end men: Ben Yee, who wore a polar fleece and glasses, said that he was a veteran of the Silicon Valley scene. Guvench told me that he had worked for eBay, improving its payment system by rebuilding old code. He’s also a dev-ops specialist. He spent some years at the gaming company Kabam, where he ran the back end for the official Hobbit game. “It was his job to make sure millions of people could play the game without it crashing,” Guvench said.

Max Nanis, a twenty-four-year-old, was the developer Solomon had mentioned to Bradley in New York. Guvench told me, “Max does fucking everything.” Nanis looked as if he had walked out of a computer-science-themed Harlequin novel: he wore glasses and a leather jacket, and had long red hair that fell down his back. His shirt was unbuttoned low, showing off a pale, bony chest. Nanis told me that he likes to work on “anything that’s really hard. I prefer it if somebody comes to us and says, ‘Two people have failed at this. Can you get an M.V.P. functional?’” (M.V.P. stands for “minimum viable product.”) He’s also a sculptor, and, as Solomon had noted, has a day job in the Scripps Institute’s molecular-and-experimental-medicine department. “We’re using computers to help solve biological problems,” he said. (He sleeps three hours a day.) He added, “I don’t do any Web-site design. I don’t like that stuff.”

The 10xers told me that being a sought-after technologist isn’t as fun as it sounds. Star developers don’t have the brand-name recognition of Brad Pitt or Bono; as a result, when they work for nontechnical clients they often feel unappreciated. Frequently, they run into misunderstandings about the scope or the requirements of a project. Nanis

described one huge project, for a railroad contractor, building an app that would allow surveyors to evaluate rail-crossing safety using iPads. He had almost finished a prototype, he said, when he received an e-mail from the train company saying, “Oh, yeah, the people in the field won’t have an Internet connection.” He had to scrap everything he’d built. “That hurt,” he said. “That was before 10x.”

“Have you ever read ‘Hackers and Painters?’” Nanis asked, citing a book by Paul Graham, the co-founder of the startup incubator Y Combinator, who has studied painting. In the book, Graham compares software to Leonardo da Vinci’s portrait of Ginevra de’Benci—noting the care with which da Vinci painted each leaf of a juniper bush in the background. “Great software, likewise, requires a fanatical devotion to beauty,” Graham writes. “If you look inside good software, you find that parts no one is ever supposed to see are beautiful too.” Nanis agreed with this assessment, and many of the 10xers seemed to appreciate the music world’s labelling of its stars as “artists.” Nanis said that when he builds a Web site from scratch he has to go through a laborious creative process: “When somebody pitches me a design spec and says, ‘I want this to work,’ there are no tutorials for making that M.V.P. There are a million ways to get there.” He said that it was like approaching a blank canvas.

After a couple of hours, the 10xers went up to the roof of Guvench’s house and finished their drinks in the fog. It was the first time many of them had met in person. To an outsider, the conversation was somewhat difficult to penetrate. It involved phrases like “You’re a scrum guy?” and wandered from Das Keyboards to the iOS prototyping tool Proto.io. Siegel mentioned that he’d given a talk about the language at Xerox PARC. “Oh, sick!” Nanis said. “To me, Xerox PARC is the most old-school, cool tech place to be.” Another 10xer said that he appreciated the group’s band-of-outsiders camaraderie. “We should do this more often,” he suggested to Guvench.

Later, Guvench and I took an Uber to his next destination: a barbecue for alumni of Y Combinator. The barbecue was in a warehouse owned by the startup Move Loot. It was full of forklifts and



plastic-wrapped couches, and youthful entrepreneurs milled around tables displaying trays of smoked meat. I took out my notebook and noticed that two young programmers were staring at me. Finally, one of them came over and introduced himself. His name was Paul Cretu, and he and his partner were working on transcription software that records everything you say, leaving you with a searchable record of your thoughts and conversations. He wanted to hear all about my reporter’s notebook and how I was using it. “We’ve never seen anyone taking notes in the wild,” he said.

There are plenty of people who are skeptical about 10x’s model. Chris Fry, the senior vice-president of engineering at Twitter from 2012 to June of this year, told me that bringing an agent into meetings would be “socially awkward.” He also didn’t need help finding programmers. “At Twitter, you get the best résumés on your desk already,” he said. “There’s an internal recruiting department, and you have all your referrals from the people who work there.” Sam Altman, of Y Combinator, said that, in the small world of Silicon Valley, the very idea of talent agents presents a “negative-

selection problem”: “The actual 10x engineers don’t need or want an agent; people quickly discover they’re great, and they end up picking where (and especially with whom) they want to work. In my limited experience, the engineers that get agents are bad.”

But Guvench argued that his clients don’t need help finding work; rather, they need people to help them navigate their options. “Tom Cruise doesn’t need help finding work, but he has an agent,” he said. Which leads to another potential problem: wouldn’t 10x’s nascent business be crushed if some major Hollywood agents decided to open a tech division in San Francisco? (Cruise’s agents, C.A.A., have diversified into other industries, such as video games and sports.) Guvench told me that he’d already confronted this scenario. Last year, not long after a *Bloomberg Businessweek* article came out about 10x, representatives from U.T.A., a marquee talent agency, got in touch. Guvench arranged a meeting with the Hollywood team at his house in San Francisco. “We were afraid of them,” he said. “I was really nervous going into this meeting. I was kind of playing things close to my vest.”

But U.T.A.’s message was not what he

had expected. “They said, ‘We need to hire programmers. We can’t find any. Can you help us?’” Guvench told me he realized then that Hollywood didn’t pose a threat. For the most part, he said, “they’re in a very different world.”

Jeremy Zimmer, the C.E.O. of U.T.A., told me that this wasn’t completely true. In recent years, he said, agents from his company have been trying to acquire a “real, working knowledge” of Silicon Valley’s ecosystem—that’s why they flew up to San Francisco. Zimmer said that he liked the idea of tech stars having agents. “So much power currently lives in the hands of the major tech platforms that having somebody who can come in and disrupt that a little bit makes a lot of sense.” He added, “I think it’d be too soon to say it’s something we wouldn’t do.”

The rise of agents and managers hastened the collapse of the Hollywood studio system. “They’re also involved in ‘exploiting’ the act, so to speak, but they’re doing it as a partner,” Solomon told me. And, while Hollywood agencies started out representing actors, they eventually took on people up and down the food chain—writers, directors—until they began selling entire film projects with a team already in place, a practice known as “packaging.” 10x hopes to do the same thing in the tech world. Guvench told me that, ideally, if a company comes to 10x with a proposal, the agents can offer “concepting, designing, building, user experience, testing, optimizing, branding, and marketing.” The company gets the product, and eliminates the costs associated with taking on full-time employees. Guvench said, “Everybody wins.”

The 10x agents recently found their first nontechnical client: Mark Mian, a branding and marketing specialist. Mian was in Guvench’s living room, looking buff, in a black shirt with a beard and a tribal earring. (Along with his branding and marketing work, he used to run a boutique gym where he worked with Muay Thai fighters and other martial artists.) He told me that he and Guvench met through “the community of techno-hippies loosely revolving around” the Phage, a “sciencey” camp at Burning Man. When he met Guvench, Mian told me, he was feeling exhausted, after working at the San Francisco offices of Interbrand and freelancing for many years. He

specializes in “humanizing tech.” He didn’t like the forty-hour workweek and felt that the corporate life style was “not conducive to respecting the mistress of creativity,” he said. “Creativity is a fickle mistress, but when the booty call comes in you’ve got to go.” He approached Guvench, wanting to rebrand 10x to include all kinds of talent. The agency took him on.

According to Guvench, 10x is riding the wave of a “macro trend.” The combination of the nascent digital age and the global recession has led to a rise in independent contractors. Some people call this new world the “gig economy” or the “1099 economy,” after the tax form used by freelancers. “I think it’s the future of work,” Guvench said. Mian agreed. “I think everyone should have a manager,” he told me. “Not just creative people—everyone. It’s cool to have an advocate and a confidant. We can all be rock stars.”

David Autor, an economist at M.I.T., wasn’t so sure. He said that the rock-star model makes sense only for people with “unique talents, which most people do not have.” Talented coders are like heart surgeons: “I’d rather have one really good heart surgery than three mediocre ones. This is what an economist would call indivisibility.” Like Tom Cruise and heart surgeons, the best programmers will probably always be in demand. The rest of us are more replaceable, Autor said, which means that, in general, given the choice most of us would probably choose to have an employer shield us from the vicissitudes of the marketplace.



By many measures, the star system didn’t work that well for Hollywood: it made moviemaking more expensive, which made studios more risk-averse, which led to inferior creative projects. And programmers are not movie stars—not yet, anyway. “Movie stars have their own brands,” McKinnon, the Okta C.E.O., said. “People will go to see a movie just because it has Tom Cruise in it. But programmers don’t really have that. No one’s going to pay for a product

just because James Gosling built it.” (Gosling is one of the inventors of Java.) “Well, geeks like me will. But most people won’t. They pay for a service.”

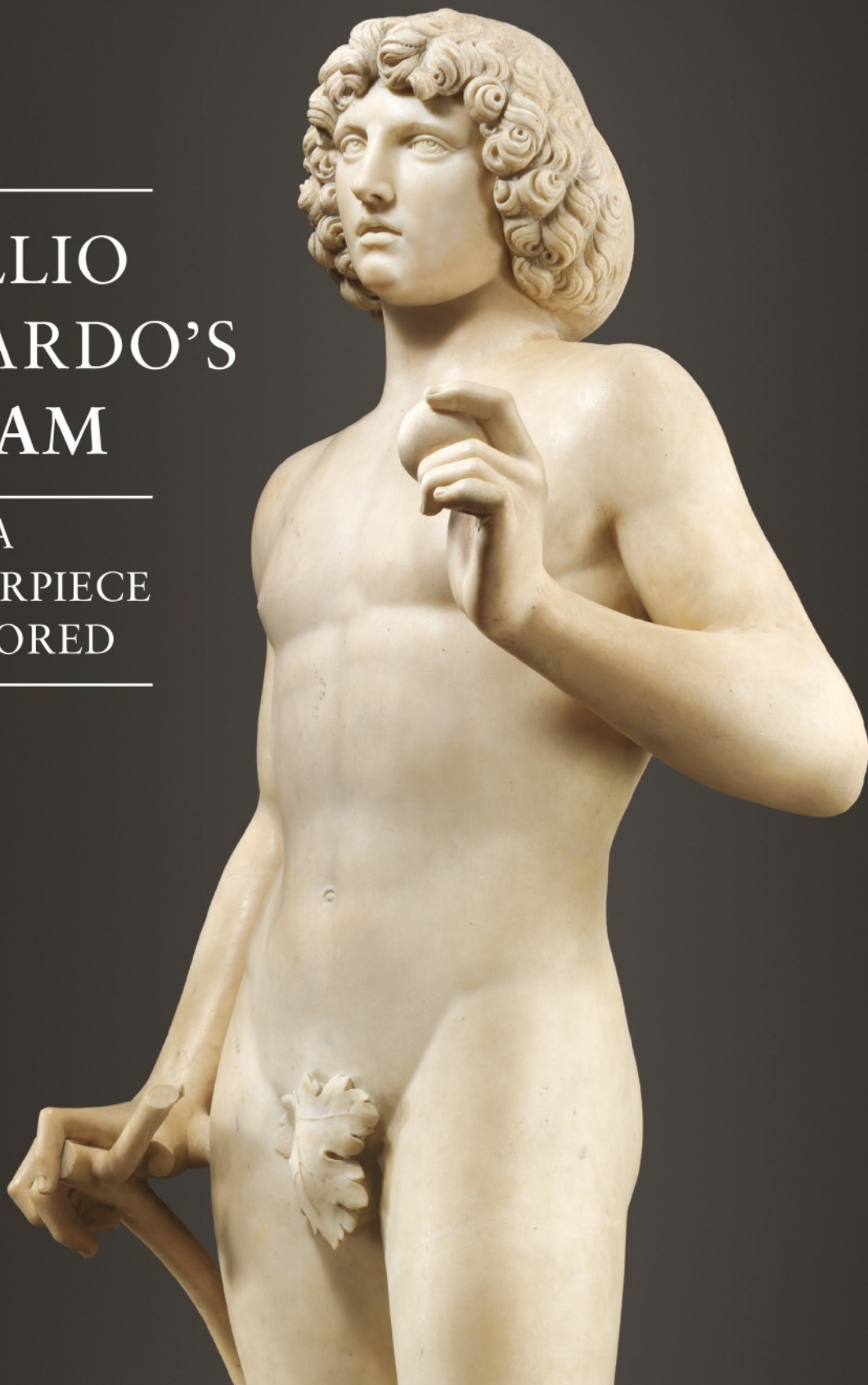
Solomon told me that he and Blumberg recently went over their year-end accounting numbers, and found that their clients’ earnings had doubled between 2013 and 2014. 10x technologists are working with a variety of customers: Live Nation, a virtual-reality startup, and an N.B.A. player who has an idea for a social-messaging app. Solomon admitted, however, that this list is somewhat random—it consists mostly of people who found 10x through Google, or whom he or his clients know personally. He has hired a salesman, to pitch 10x to companies. “Exactly how we tap into the pipeline of companies and startups that need us is still something we’re nailing down,” he said. “We haven’t figured out where the fire hose is.”

As for Stephen Bradley, the head of AuthorBee, he hasn’t found his star programmer yet. Nanis wasn’t right for the job—Bradley wanted someone who could one day become AuthorBee’s C.T.O. “He and I had a call, and he was, I would say, a fantastic candidate, but he wasn’t quite the right fit for what I needed,” Bradley told me.

Nanis wasn’t bothered—he’d just begun a new freelance gig, which he said he is “super into.” He will be building a social platform for selling art, called Available Works, started by Asher Penn, who runs the New York-based publication *Sex Magazine*, and has received funding from an angel investor. 10x didn’t help Nanis to get the job, but it did help him to negotiate his contract, which he said was critical, since the art people didn’t seem to have a clear idea of what they wanted. “Normally, that’s a red flag,” Nanis said. He put them on the phone with Solomon, who spent two weeks hammering out a detailed contract and a plan of action, which, Nanis said, has made everything smoother. “It’s super refreshing for me to do cool, socially and demographically relevant work.” He was getting ready to pull an all-nighter, hoping to be done with the project by January. The plans for the Web site had come into focus and, he said, “I’ve had two calls with Asher, and we only discussed, What is best for the artist?” ♦

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1.1 Improved visuals with "Light" expansion pack. Replaces "darkness."

1.2 "Land Animal" expansion pack: zebras, mice. "Fish" expansion pack: eels.

1.3 "Object" expansion pack: tools, human female.

1.4 First-generation Apple product added to Garden of Eden interface.

1.5 "Human Condition" expansion pack: shame, guilt, homicidal violence. NOTE: CRUCIAL DOWNLOAD. WITHOUT DOWNLOAD, BIBLE CANNOT FUNCTION.

1.6 "Sodom and Gomorrah" N.S.F.W. glitch identified and removed. Bible now free of "Homosexuality" virus.

1.7 "Fish" expansion pack: sponges.

1.8 "Bad Things Happen to Good People" glitch identified but not fixed.

1.9 Fixes "Noah's Flood" virus, which may result in widespread data loss.

1.10 Update adds dozens of colors to "Joseph's Dreamcoat" section. Includes: light blue, maroon, dark blue. Removes homosexual colors (lavender, goldenrod).

1.11 New feature allows user to play as Job (difficulty level: "very hard").

1.12 "Fish" expansion pack: manta rays.

VERSION 2.0: "New Testament" expansion pack. Adds Jesus features.

2.1 Fixes "Immaculate Conception" glitch. All conceptions now maculate.

2.2 "Human Condition" expansion pack: sexual humiliation, homosexual desire, homosexual repression. NOTE: CRUCIAL DOWNLOAD. WITHOUT DOWNLOAD, BIBLE CANNOT FUNCTION.

2.3 New "Rosary" feature allows user to bypass help toolbar and speak directly with Mary. (Note: "Mary" outsourced to India.)

2.4 New three-for-the-price-of-one deal on Christian-deity bundle. Nominal fee for update (ten-per-cent tithe).

2.5 Sabbath upgrade: Saturday to Sunday. Saturdays now available for work, heterosexual intercourse.

2.6 Easter eggs added: "Holy Grail," "Shroud of Turin," "Easter Egg."

2.7 "Jesus AutoSave" feature. Re-



stores Jesus to previously saved form three days after data loss.

2.8 Limited editions available: King James, U2.

VERSION 2.0.1: Inspires popular Koran download. Part of iSlam app.

VERSION 3.0: Industrialization-compatible.

3.1 No longer punishable by death: rounded haircuts, ripped clothing. Beatles-compatible.

3.2 No longer punishable by death: adultery. John Edwards-, Tiger Woods-, Bill Clinton-, Hugh Grant-, David Letterman-, Jude Law-, Prince Charles-compatible.

3.3 "Shuffle" feature allows user's fate to be randomly assigned whether or not user is morally and spiritually good. See: Hiroshima, Darfur.

3.4 User-helpline feature removed. Direct prophet link from human to God now available online. Go to F.A.Q.s.

3.5 "Fish" expansion pack: that one with the light on its head.

VERSION 4.0: Evolution-compatible. "Missing Link" Easter egg added.

4.1 "Shellfish" expansion pack (replaces "kosher"). Lobster-bisque-compatible.

4.2 Newest Gideon edition bundled with hotel-room drawers.

4.3 Last version compatible with Mac OS 9/slavery.

4.4 "Dog" expansion pack: Labradoodles.

VERSION 5.0: Slavery-incompatible. For continuing access to slavery, use previous versions of Bible.

VERSION 6.0: Homosexuality-compatible. Homosexual colors added back (sea-foam green, fire-engine red).

6.1 Eve now known as Steve.

6.2 "Original Sin" glitch fixed; basic human goodness implied.

6.3 "Bad Things Happen to Good People" bug still presents problems. "Marijuana" patch now allows program to function until solution is found.

6.4 Fish removed owing to climate-change bug: whitefish, sea bass. "Fish" expansion pack: nuclear-mutated fatty tuna.

6.5 "Black people" now known as "people."

6.6 "Gay people" now known as "people."

6.7 "Sodom" now known as "West Hollywood."

6.8 "Hell" now known as "Florida."

6.9 Limited-edition Kanye West Messiah edition available. "Yeezus" features added.

6.10 "Westboro Baptist Church" virus eliminated. Sent to Hell (Florida) for violating terms and conditions of Bible.

6.11 "Gay Marriage" expansion pack (available in certain areas).

6.12 "God" feature removed entirely. Replaced with "The Cloud." ♦

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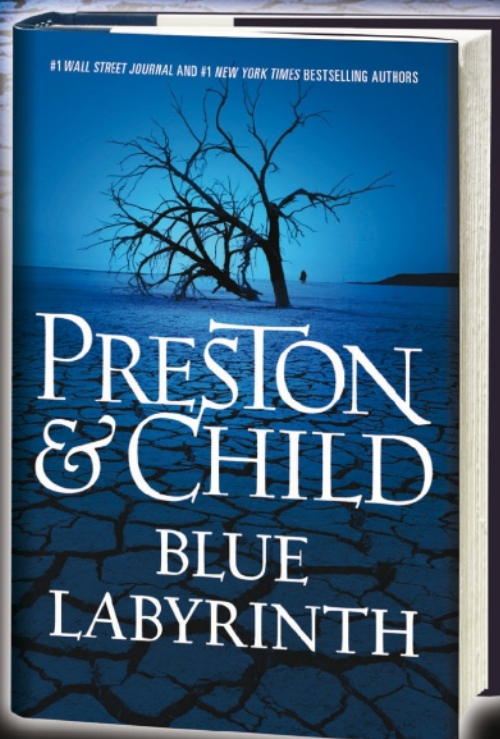
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ANNALS OF MUSIC

REVENUE STREAMS

Is Spotify the music industry's friend or its foe?

BY JOHN SEABROOK



Daniel Ek, the C.E.O. of Spotify, is a rock star of the tech world, but he is not long on charisma. At thirty-one, he is pale, boyish, cerebral, and calm. *Jantelagen*, the Scandinavian code of humility and restraint, is strong in him. He doesn't greet you with a firm handshake from behind an imposing desk; he doesn't have a desk. He sprawls on a couch with his laptop, like a teen-ager doing homework. Or he wanders the company's offices, which form an oval around the open core of a big building on Birger Jarlgatan, in central Stockholm. The design encourages "random encounters," which Ek once read was Steve Jobs's plan in laying out Pixar's offices.

Ek's phlegmatic manner makes his unshakable, almost spiritual belief in Spotify burn all the more brightly. His vision, that Spotify is a force for good in the world of music, is almost Swedenborgian: salvation in the form of a fully licensed streaming-music service where you can find every record ever made. Spotify doesn't sell music; it sells access to it. Instead of buying songs and albums, you pay a monthly subscription fee (\$9.99), or get served an ad every few songs if you're on the free tier. You can listen to anything on the service—the Beatles (as with iTunes, the surviving members are not rushing in) and Taylor Swift (who left the service in a

flurry of publicity in early November) notwithstanding—and there is an astonishing amount of music. When Spotify launched, in October, 2008, in Sweden and a handful of other European countries, Ek's dream seemed like the longest of long shots. Now Spotify is the Netflix of music sites. Mark Zuckerberg, Facebook's founder, says, "Daniel just saw the opportunities of streaming music before anyone else."

Spotify appeared nine years after Napster, the pioneering file-sharing service, which unleashed piracy on the record business and began the cataclysm that caused worldwide revenues to decline from a peak of twenty-seven billion dollars, in 1999, to fifteen billion, in 2013. The iTunes store, the industry's attempt, in partnership with Apple, to build a digital record shop, opened in 2003 to sell downloads, but that didn't alter the downward trajectory; indeed, by unbundling tracks from the album, so that buyers could cherry-pick their favorite songs, Apple arguably hastened the decline. Legal actions against individuals—thousands of people in the U.S. were sued for downloading music illegally—only alienated potential customers. As bad as the bloodbath was in the U.S., the situation was even worse in Sweden. Pelle Lidell, an executive with Universal Music Publishing in Stockholm, told me that by 2008 "we were an inch away from being buried, and Spotify single-handedly turned that around."

Ek was one of the pirate band. Before starting the company, he had briefly been the C.E.O. of uTorrent, which made money in part by monetizing pirated music and movies on BitTorrent, a major file-sharing protocol. Later, the Napster co-founder Sean Parker, for years Public Enemy No. 1 to record-company executives, joined forces with Ek. Who would have imagined, as one label head put it recently, that "your enemy could become your friend"?

Spotify is now in fifty-eight countries. (Canada, its latest market, got the service at the end of September.) It has raised more than half a billion dollars from investors, including Goldman Sachs, to fund its expansion, and there are rumors of an I.P.O. in its future, to raise more. Spotify's user base exceeds fifty million globally, with twelve and a

Daniel Ek says his company is "not in the music space—we're in the moment space."

PHOTOGRAPH: EYEVINE/REDUX

“After nine years, four Priuses, and over 300,000 miles, we wouldn’t drive anything else.”*

The Huangs, Prius owners



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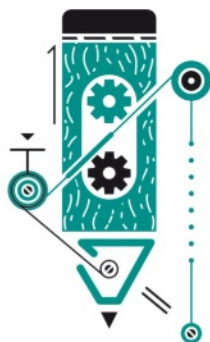
half million paying subscribers. At the current rate of growth, that number could reach forty million subscribers by the end of the decade. To date, it has paid out more than two billion dollars to the record labels, publishers, distributors, and artists who own the rights to the songs. “I’m very bullish on it,” Tom Corson, the president of RCA Records, said. “The all-you-can-eat access model is starting to make sense to people. And we expect that free is going to roll into subscription and that is going to be a really huge part of our business.”

The question of whether Spotify is good for artists is considerably more vexed. The service has been dogged by accusations that it doesn’t value musicians highly enough. In 2013, Radiohead’s Thom Yorke memorably called Spotify “the last desperate fart of a dying corpse,” a remark that “saddened” Ek. In July, Taylor Swift wrote in a *Wall Street Journal* editorial, “In my opinion, the value of an album is, and will continue to be, based on the amount of heart and soul an artist has bled into a body of work.” For Swift, streaming is not much different from piracy. “Piracy, file sharing and streaming have shrunk the numbers of paid album sales drastically, and every artist has handled this blow differently,” she wrote.

In early November, when Swift’s new album, “1989,” was released, her label, Big Machine Records, not only declined to make the album available on Spotify but also removed her entire catalogue from the service. Is this a gesture of artistic solidarity, or, as one insider put it, “a stunt to wring the last drop of blood out of what is a dying model”—i.e., album sales? Swift’s impressive first-week sales of “1989,” which were just under 1.3 million albums, making her the year’s top seller, are still well short of the all-time first-week high, 2.4 million, set by ‘N Sync, in 2000. And the sixty-nine-per-cent drop-off in “1989”’s second-week sales suggests that Swift’s seventy-one million Facebook fans didn’t rush out and buy the album when they couldn’t get it on Spotify. They just streamed whatever was available on YouTube, which pays artists even less

than Spotify does, or on other sites. Or they set sail for the Pirate Bay, where the album was also No. 1.

On Spotify, music consumption is “frictionless”—a favorite word of Ek’s. In tech terms, we’ve gone from a world of scarcity to one of abundance. Nothing is for sale, because everything is available. The kind of calculations you make on iTunes, such as “I like this song, but not enough to buy it,” don’t matter. It is a music nerd’s dream, which may be why the user population on Spotify tends to lie outside the mainstream. On Spotify, the Pixies’ top songs have about four times as many streams as Neil Diamond’s biggest hits.



The difference between Spotify and Internet radio services, like Pandora, is that Spotify is interactive. You can sample the complete catalogue of most artists’ recordings. (Spotify also has a non-interactive radio component.) Spotify now has some twenty million songs on the service, and twenty thousand new ones are added every day. If you are a “lean forward” listener—that is, the kind of motivated fan who takes the time to discover the music you want—Spotify is a celestial jukebox. But, for Spotify to continue its rapid growth, it must bring in the “lean backers” Pandora caters to. Spotify tries to do this with playlists. It has staff-curated playlists, and users can also make their own—there are more than a billion on the site. The playlist is the album of the streaming world. Spotify is working on getting its service into car stereos, and is negotiating agreements with automobile companies; one such agreement was announced this week. The power of playlists will only grow.

When Spotify launched in the U.S., in 2011, it relied on simple, usage-based algorithms to connect users and music, a process known as “collaborative filtering.” These algorithms were more often annoying than useful. *You think because I listened to Neil Young that I want to listen to America? America ripped Neil Young off!* But over time the algorithms have improved. Earlier this year, Spotify bought a Boston-based startup called the Echo Nest, which has developed a form of artificial music intelligence—a

kind of A.I. hipster that finds cool music for you. The Echo Nest powers Spotify’s automated radio stations and is also behind an in-house programming tool called Truffle Pig, which can be told to sniff out music with combinations of more than fifty parameters, such as “speechiness” and “acoustic-ness.” Now that the Echo Nest is part of Spotify, its team has access to the enormous amount of data generated by Spotify users which show how they consume music. Spotify knows what time of day users listen to certain songs, and in many cases their location, so programmers can infer what they are probably doing—studying, exercising, driving to work. Brian Whitman, an Echo Nest co-founder, told me that programmers also hope to learn more about listeners by factoring in data such as “what the weather is like, what your relationship status is now on Facebook.” (In 2011, Facebook entered into a partnership with Spotify.) He added, “We’ve cracked the nut as far as knowing as much about the music as we possibly can automatically, and we see the next frontier as knowing as much as we possibly can about the listener.”

All this, Ek explained, will help Spotify to better program the “moments” of a user’s day. “We’re not in the music space—we’re in the moment space,” he told me. The idea is to use song analytics and user data to help both human and A.I. curators select the right songs for certain activities or moods, and build playlists for those moments. Playlists can be customized according to an individual user’s “taste profile.” You just broke up with your boyfriend, you’re in a bad mood, and Justin Timberlake’s “Cry Me a River,” from the “Better Off Without You” playlist, starts. Are you playing the music, or is the music playing you?

You can design your own Spotify day. You wake to the “Early Morning Rise” playlist (Midnight Faces, Zella Day), and get ready with “Songs to Sing in the Shower” (“I’m hooked on a feeling/I’m high on believing”). Depending on how much work you have, there’s “Deep Focus,” “Brain Food,” or “Intense Studying.” By eleven-thirty, you’ve hit “Caffeine Rush,” and, after a sandwich at your desk (“Love That Lazy Lunch”), it’s time to “Re-Energize” (Skrillex, Deorro) for the afternoon. A late-in-the-day “Mood

Booster" (Meghan Trainor) gets you pumped for your workout (there's a "House Workout," a "Hip Hop Workout," and a "CrossFit Mix," to name just a few). Then it's "Happy to Be Home" (Feist, the Postal Service). After "Beer n' Burgers" (rockabilly) or "Taco Tuesday" (Celia Cruz), you "Calm Down" (Wilco, the National) and then, depending on your love life, click on "Sexy Beats" or "Better Off Without You" (or maybe "Bedtime Stories," for the kids), followed by "Sleep" (heavy on Brian Eno, king of the z's).

My problem with playlists is not the Starbucks rubrics, or the spying on my embarrassing Lana Del Rey obsession. My problem is that I end up skipping most of the songs anyway. I lean forward and check the next song when I'm supposed to lean back. The human or the A.I. who chose Pharrell's "Happy" for the "Mood Booster" playlist isn't getting the job done for me.

By the time he turned twenty-two, Daniel Ek had achieved his life's ambition: he was rich. A gifted programmer, he had been making money by working on Internet-based tech products since he was fourteen. After selling an Internet advertising company called Advertigo, in 2006, he retired. He rented a big place in Stockholm. He bought a red Ferrari and drove it to night clubs, where he arranged for good tables for friends and attractive female companions, whom he plied with expensive champagne. He lived like this for a year or so, until one morning he awoke to a startling realization. "I was completely depressed," he said.

"I realized the girls I was with weren't very nice people," Ek went on, "that they were just using me, and that my friends weren't real friends. They were people who were there for the good times, but if it ever turned ugly they'd leave me in a heartbeat. I had always wanted to belong and I had been thinking that this was going to get solved when I had money, and instead I had no idea how I wanted to live my life. And no one teaches you what to do after you achieve financial independence. So I had to confront that."

Ek describes himself as "missionary," by which he means he likes to formulate five-year missions for himself. "That's how I think about life," he said. "Five years is long enough for me to achieve

something meaningful but short enough so I can change my mind every few years. I'm on my second five-year commitment on Spotify. In two years, I will have to make my next one. I will need to ask myself if I still enjoy what I'm doing. I'm kind of unusual that way, but it gives me clarity and purpose."

Ek sold the Ferrari, got rid of the apartment, and moved to a cabin near his parents' place in Ragsved, a Stockholm suburb, where he meditated about what to do with his life. He had soul-searching conversations with Martin Lorentzon, the Swedish entrepreneur who had bought Ek's advertising company, and was himself looking for a new project. "And we always came back to the music industry," Ek said. Like many teen-agers around the turn of the millennium, Ek had become infatuated with Napster—in particular, with the idea of a site where all the world's music was available for free. Radio offered free music, too, of course, but radio wasn't interactive; you couldn't pursue your own interests, the way you could on Napster. Ek said, "Before that, I was listening to Roxette," a Swedish pop-rock band from the eighties. "I discovered Metallica and learned that they were inspired by Led Zeppelin, and King Crimson, and then I got into the Beatles. And from there I went to Bowie and the whole British scene from the Eurythmics to the Sex Pistols. Hearing the anger and frustration of the Sex Pistols or the Clash made you feel like you were in the seventies. You started to understand culture. It was pretty magical.

"It came back to me constantly that Napster was such an amazing consumer experience, and I wanted to see if it could be a viable business," Ek went on. "We said, 'The problem with the music industry is piracy. Great consumer product, not a great business model. But you can't beat technology. Technology always wins. But what if you can make a better product than piracy?'" Ek continued, "Piracy was kind of hard. It took a few minutes to download a song, it was kind of cumbersome, you had to worry about viruses. It's not like people want to be pirates. They just want a great experience. So we started sketching what that would look like."

Their "product vision," in tech parlance, was that the service had to give the impression that the music was already on

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your hard drive. “What would it *feel* like?” Ek asked. “That was the emotion we were trying to invoke.” The key was to build something that worked instantly. Streaming, whether audio or video, tends to have built-in delays while you wait for the file, which is stored on a server in the cloud. But if the music starts in two hundred milliseconds or less—about half the time it takes, on average, to blink—people don’t seem to perceive a delay. That became Ek’s design standard. He told his lead engineer, Ludvig Strigeus, a brilliant programmer he had worked with before, “I don’t accept anything that isn’t below two hundred milliseconds.”

Strigeus responded, “It can’t be done. The Internet isn’t built like that.”

“You have to figure it out,” Ek insisted.

The solution involved designing a streaming protocol that worked faster than the standard one, as well as building their own peer-to-peer network, a decentralized architecture in which all the computers on it can communicate with one another. In four months, they had a working prototype.

“And I knew when we had it that it was going to be very special,” Ek said.

Ek’s original idea was to launch Spotify in the U.S. at the same time that he launched the service in Europe. Ken Parks, Spotify’s chief content officer, said, “Daniel thought he could just go down to the corner store in Stockholm and pick up a global license.” He didn’t realize that he would have to negotiate directly with all the different copyright holders, a herculean task. Not surprisingly, the labels weren’t interested. Ek was an outsider—a techie, and a Swedish one at that. Parks, an attorney who’d worked at E.M.I., recalled, “We needed to overcome the music-is-free mentality that Spotify represented.” Of the labels’ attitude, he went on, “If you have something you’ve invested a ton of money in, and you’ve been selling it for a lot, and you feel raped by piracy—to say to that person, ‘The only way to beat this is to co-opt the people who are stealing from you,’ that was a challenge.” Ek said, “If anyone had told me going into this that it would be three years of crashing my head against the wall, I wouldn’t have done it.”

Eventually, Ek decided to start regionally and prove that his concept worked. “And I invested all of my personal money in it,” he told me, “saying,

STUDY WITH MELON

The stem end of a melon
is weblike, form
finding a pattern
that’s thinking itself
a density
a concentration
beginning a line
then casting it out
and moving on from,
an order established,
a gesture complete.
Completion: how
someone at a distance
might see it.

—*Lia Purpura*

you know, here’s my balls on the table. For them, the risk of trying it was kind of zero.” Swedish labels, gutted by piracy, literally had nothing to lose.

Sean Parker lives in the Plaza Hotel, in a private residence in the northeast corner of the building, looking out at Fifth Avenue and Central Park South. The grand, high-ceilinged dining room has commanding views in both directions, and it was there that the thirty-four-year-old billionaire was sitting on a warm fall afternoon, dressed in jeans and rust-colored high-tops, drinking tea from a white china cup. It was a setting that would have impressed Edith Wharton, even if the owner’s attire might not have.

Parker was talking about Napster, which he and Shawn Fanning started back in 1999. “Napster had been this cultural revolution, much more than it was ever a legitimate company,” he said, stroking his neatly trimmed beard. Napster, which had sixty million registered users at its peak, taught the world how to get music from the Internet. Parker says he had always wanted to go legit, by making a deal with the record industry, but instead the labels put Napster to sleep. “There was this unique opportunity in history. We said, ‘If you shut down Napster, it’s going to splinter, and you’re going to have a Whac-A-Mole problem on your hands, where you’re fighting service after service and you’re never going to get all those users back in one place.’ And that’s what

happened.” From the dragon’s teeth sprang Kazaa, Grokster, Morpheus, and Limewire. “It was one of those things where it can be totally clear to you and everyone in your generation and you can explain it in the clearest of terms, not as a threat or a negotiating tactic—just, ‘Look, you just have to see this.’ And they couldn’t see it.” Napster was the enemy, pure and simple, and it had to be killed. “This was the biggest existential threat to the music business and they wouldn’t listen.”

Parker sipped his tea. “So I went off and did other things”—he became president of Facebook in 2004, and helped turn it into a company, which helped turn him into a billionaire—“but in the back of my mind I was thinking about the untimely fate that Napster had met. That aborted mission.” He had watched while other entrepreneurs tried to realize the dream that was Napster. “They’d try to negotiate with the record labels and they really didn’t speak the language and they’d end up adapting their product vision to the terms they were able to get,” he said. In 2009, a friend told him about a Swedish service called Spotify. Parker had never heard of it. He sent Daniel Ek an e-mail and they arranged to meet.

“The thing that made Spotify very different when I first met Daniel and Martin was that they had this incredible stubbornness,” Parker went on. “In a good way. They were willing to let the product vision lead the business deals.” He agreed to invest in the company and help Ek in

his negotiations to enter the U.S. market. “Daniel said, ‘I think it’s going to take six weeks to get our licenses complete.’ It ended up taking two years.” Of the four global music companies at that time—E.M.I., Sony, Warner Music, and Universal—Ek had managed to get E.M.I. and Sony on board, but Universal and Warner were holdouts. The latter was led by Edgar Bronfman, Jr., who had spearheaded the move to close down Napster, back in 2001.

This time, Parker was more persuasive. “He did know a lot of people,” one top label executive said. “Daniel Ek didn’t. And he worked it non-stop.” The Swedish trial period was key. The record industry’s total revenues in Sweden grew by more than a third between 2008 and 2011. Piracy plummeted. As the label executive recalled, “It was like—O.K., proof of concept, we should be doing this if we can get the right license.”

Another factor in the labels’ thinking was Apple’s iTunes store, which had proved to be an unsatisfactory business partner. Music had been an important part of Apple’s business when Steve Jobs first negotiated the iTunes licenses, back in 2002—the music helped sell the iPod. But by 2011 music was more important to the Apple brand than to its business. Apple would not even let Android users, who today represent more than eighty per cent of the global mobile business, have iTunes on their phones, because it wanted to sell iPhones. Spotify offered a way out of a troubled marriage.

Thomas Hesse, who led the negotiations for Sony, told me, “The main reason it took so long for Daniel to get all the majors on board was that he had this free tier, where all the music was on demand. Was that going to cannibalize the download world?” In the end, the free tier was limited to personal computers, so users would have to pay for subscriptions in order to listen on their mobile devices, a major incentive to convert to the paid tier. Nevertheless, Hesse continued, there was “a lot of discussion about how much Spotify needed to pay for the free streaming and how many paying subscribers it could potentially guarantee.”

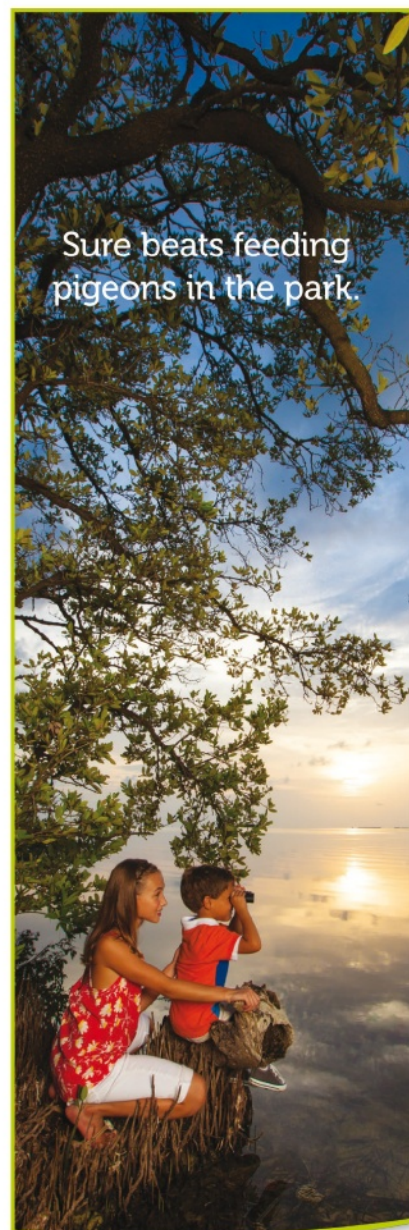
After Universal made a licensing agreement with Spotify, Warner was virtually compelled to join the other major labels in negotiating. At the time, the company was also looking for a buyer. Parker told me that he tendered an offer

to buy Warner with Ron Burkle, the Los Angeles-based venture capitalist. When another buyer, the Russian oligarch Len Blavatnik, expressed interest, Parker said that he told him, “Look, if you make Spotify contingent on the deal, I will withdraw my offer and you’ll get the company.” In 2011, Blavatnik bought Warner, for \$3.3 billion. Parker became a Spotify board member and helped broker its partnership with Facebook.

The exact terms of the licensing deals that Spotify made with the majors are not known; all parties signed nondisclosure agreements. In addition to sharing with other rights holders nearly seventy per cent of the money Spotify earns from subscriptions and ad sales—about the same revenue split that Apple provides on iTunes sales—the majors also got equity in Spotify, making them business partners; collectively, they own close to fifteen per cent of the company. Some analysts have questioned whether Spotify’s business model is sustainable. The company pays out so much of its revenues in fees that it barely makes a profit. It operated at a loss before 2013. (The company maintains that its focus has been on growth and expansion.) The contracts are renegotiated every two or three years, so the better Spotify does, the more, in theory, the labels could ask for. This makes Spotify unlike many Internet companies, in which the fixed costs of doing business become relatively smaller with scale. For Spotify, scale doesn’t diminish the licensing fees.

When Spotify began in the U.S., labels demanded up-front payments as the price of getting in the game. These payments were not always passed along to the content creators, even though it is their work that makes the catalogues valuable in the first place. Month by month, Spotify pays the major labels lump sums for the entire market share of their catalogues. How the labels decide to parcel these payments out to their artists isn’t transparent, because, while Spotify gives detailed data to the labels, the labels ultimately decide how to share that information with their artists. The arrangement is similar on the publishing side. Artists and songwriters basically have to trust that labels and publishers will deal with them honestly, which history suggests is a sucker’s bet. As one music-industry leader put it, “It’s like you go to your bank, and the bank says, ‘Here’s your salary,’ and you say, ‘But what is my

Sure beats feeding pigeons in the park.



Birds aren’t the only migratory species in The Florida Keys this time of year. In fact, with everything from the Wild Bird Center and Great White Heron National Wildlife Refuge to the occasional parrot on a pirate, it’s a great place for everyone to smooth their ruffled feathers.

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employer paying me? I work for them, not you!' And the bank says, 'We are not going to tell you, but this is what we think you should get paid.'"

Parker's tea had grown cold, and he poured some hot water into it. The October light dimmed in the high Plaza windows. He pondered the progress of the tide of humanity flowing up and down Fifth Avenue. For him, Spotify was a do-over—a second chance to get Napster right. And that felt "very vindicating."

The deals that Spotify made with the major labels launched on-demand streaming in earnest. But although the way the consumer gets access to music had changed, the way the creators of music are paid for their work had not. Somehow, the billions of micro-payments parcelled out in the form of streams have to be reconciled with a royalty-payments system that is rooted in a century-old sales model. No economic infrastructure exists for that apples-to-oranges transformation.

Spotify is only one of many streaming sites. There are competing services like Rhapsody (which recently bought a re-branded, fully licensed Napster), Rdio, and Google Play Music, but there are also thousands of other sites where songs are streamed. Labels, publishers, and performing-rights societies struggle with dozens of different technologies to monitor this welter of outlets. And with any given stream of a song there is a myriad

of copyrights—performing and mechanical rights apply to both the recording and the composition—which makes sorting out who's owed what no easy matter. Liz Penta, an artist manager in New York, told me that, in addition to larger payments, she regularly gets checks for one penny from the Harry Fox Agency, which administers mechanical royalties for Spotify, among other streaming services. YouTube, which is by far the largest streaming-music site in the world (it wasn't designed that way—that's just what it became), is notorious among rights holders in the music industry for its measly and erratic payouts. Spotify's exponential growth rate suggests that the chaos in royalty collection is only just beginning.

Not surprisingly, companies that specialize in digital royalty collection constitute one of the hottest growth sectors in the music business. Among the leaders is Kobalt, founded, in 2001, by Willard Ahdritz. Part collection agency, part music publisher, and part tech platform, Kobalt has built a system of enormously complex Oracle databases that compute billions and billions of transactions and royalty lines from all over the world, and collects on behalf of some two thousand artists, including Paul McCartney, Maroon 5, and Skrillex, while the rest of the industry uses Excel spreadsheets to try to piece everything together. On YouTube, Kobalt's proprietary song-detection

technology, ProKlaim, detects unclaimed videos for its clients. Ahdritz says, "We create transparency, which drives liquidity, and the money is now flowing."

Spotify's payouts to indie labels and digital-music distributors such as TuneCore are considerably more transparent than its dealings with the major labels. Spotify sends out monthly statements showing the total streams per artist, broken down into individual songs. To come up with the royalty rate per stream, Spotify divides the monthly streams of a single artist's work by the total number of streams on Spotify that month, and arrives at the artist's share. It multiplies that number by the total monthly revenues, and keeps thirty per cent. Labels, publishers, and distributors then pay the artist according to their royalty deals.

But exactly what is the royalty rate for a single stream? It depends on many factors. The more popular you are, the higher your metric. Some countries' streams are worth more than others'. Free, ad-supported streams are worth less than subscriber streams, because the company makes less on ads than on subscriptions. (One of the reasons that Swift left Spotify was that her label wanted her music to be exclusive to the premium tier in the U.S.; it was willing to make her catalogue available for free in the rest of Spotify's markets.) According to the company's Web site, the average stream on Spotify is worth between six-tenths and eight-tenths of a cent. If you do the math, that means that around a hundred and fifty streams equal one ninety-nine-cent download. But that metric is hard for many musicians and record executives to accept. (I don't stream my Lana favorites close to that many times.) On the other hand, seven-tenths of a cent is better than nothing.

Some artists are already making real money from Spotify. Swift's music was earning about five hundred thousand dollars a month at the time she pulled it. E.D.M. artists like Avicii and David Guetta are seeing payouts in the millions. Avicii's "Wake Me Up," the most streamed song on Spotify, has more than three hundred million spins, which, using Spotify's benchmark per-stream rate, would be worth about two million dollars to the rights holders. Daniel Glass, a music-industry veteran who is the founder of Glassnote Records, an indie label, told me that he is very happy



"Who put back an empty jar of formaldehyde?"

with the royalties Spotify pays his artists, who include Mumford & Sons, Phoenix, Childish Gambino, and Chvrches. “We’re getting big beautiful checks from them!” he exclaimed.

At a recent series of educational meet-ups with the music industry in New York, Nashville, and L.A., Spotify representatives tried to reassure managers and artists, offering rosy-sounding future royalties, based on growth projections. A niche indie album, which now earns thirty-three hundred dollars a month, will receive seventeen thousand dollars in royalties a month when Spotify hits forty million paid subscribers. A breakthrough indie album, now earning seventy-six thousand dollars a month, will pull in three hundred and eighty thousand dollars. A global hit album, currently earning four hundred and twenty-five thousand dollars a month, will get \$2.1 million. How likely are these projections to come true? When I asked Ek, he said, “Is there a definitive way of knowing? Of course not. But I’m not the only person who believes it. Pretty much everyone is in agreement that streaming will keep on growing over the next few years.”

AM/FM radio pays the writer of the song on a per-play basis, but gives the performer and the owner of the recording of the song—generally, the record label—nothing. On digital streaming services like Spotify, the situation is nearly reversed: the owners of the recording get most of the performance royalty money, while the songwriters get only a fraction of it. Songwriters, who can’t go out on the road, are particularly hard hit by the loss of publishing royalties. As one music publisher put it, “Basically, the major music corporations sold out their publishing companies in order to save their record labels. Universal Music Publishing took a terrible rate from streaming services like Spotify in order to help Universal Records. Which, in the end, means that the songwriter gets screwed.”

Ek’s answer to the question of whether or not Spotify is good for artists tends toward the tautological. If it’s good for listeners—and almost everyone who uses Spotify likes it—then it must be good for artists, because by encouraging more listening it will “increase the over-all pie.” Many music-business people think he’s right. Richard Jones, the Pixies’ manager, says, “Particularly for artists who are established with solid catalogues and are big

live-touring acts, streaming services can be extremely beneficial. I’m a massive supporter.” He said of Swift’s decision to pull her music, “It’s purely P.R.-driven, which is fine. But let’s not pretend it’s artist-friendly. Because actually the most artist-friendly thing here is for everyone to make streaming into something that is widespread.”

Spotify does offer undiscovered musicians new opportunities to break through. Playlists tend to be much broader in scope than commercial-radio playlists. Lorde is often cited around Spotify as an artist who gained crucial early exposure after Sean Parker heard her song “Royals” when a friend played it for him. In April, 2013, before the song was a hit anywhere, Parker added it to his “Hipster International” Spotify playlist, which currently has seven hundred and ninety thousand followers. Parker’s followers added it to their playlists, as did their followers; users shared it with one another; and within weeks “Royals” was the second most popular song on Spotify. Spotify’s director of economics, Will Page, says, “Now, remember, there is no Old World business model here, no radio pluggers or traditional marketing—just a playlist. But it’s like becoming a broadcaster. And you could see the viral nature of growth that led to this artist becoming No. 1 in America before Christmas.” Still, the fact is that Lorde had a major label and its marketing budget behind her. Jason Flom signed Lorde to his Lava label months before Parker playlisted her. “‘Royals’ was not to be denied,” Flom told me. “Nothing could stop it.” Even so, he said, “Spotify—and especially Sean—was definitely helpful in establishing Lorde the way we wanted to establish her. It gave her a foundation with the cool kids.”

Record companies are beginning to figure out how to employ Spotify’s potential to their advantage, sometimes by manipulating release dates. “Windowing” releases—start out on iTunes only, and add Spotify after two weeks of sales—is popular at some labels (and very unpopular at Spotify). In Taylor Swift’s case, Big Machine Records decided to keep her previous album, “Red,” off Spotify in the first weeks after its release in order to increase record sales. “Red” was later added to Spotify, before Swift removed the entire catalogue.

But there is another class of musicians whom Ek hasn’t helped so far. For them,

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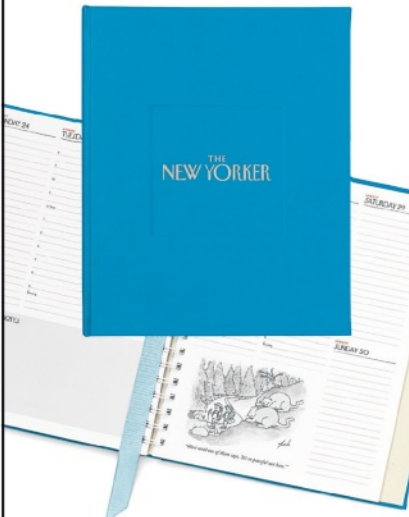
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Spotify has further eroded their CD and download sales, without coming close to making up the difference in streaming revenues. Ek acknowledges that the switch from a sales model to a streaming model could be bumpy for some artists. “In Sweden, there was one tough year and then the debate changed,” he said. “That will happen in the larger markets. The end goal is to increase the entire pool of music. Anything else is part of the transition.” He added, “This is the single biggest shift since the beginning of recorded music, so it’s not surprising that it takes time to educate artists about what this future means.”

Two artists who are part of that transition are Marc Ribot, an esteemed jazz guitarist, and Rosanne Cash, whose work has won a Grammy and received twelve nominations. Both are mid-level, mid-career musicians who are a vital part of the New York City music scene. Both have worked with major labels. (Ribot is currently releasing his music on indies.)

I met them in New York one October afternoon. Ribot and Cash brought along their Spotify numbers. In the past eighteen months, Ribot reported, his band made a hundred and eighty-seven dollars from sixty-eight thousand streams of his latest album, available on Spotify in Europe and the U.S. Cash had made a hundred and four dollars from six hundred thousand streams. The math doesn’t fit Spotify’s benchmarks, but that is how their labels and publishers did the accounting.

When I mentioned that both Ek and Parker seemed to be sincere in their desire to help artists, Ribot replied, “Well, our ‘friends’ in the online-distribution business have helped artists to go from a fourteen-billion-dollar domestic record business to a seven-billion-dollar one, and now Spotify wants to help us reduce it even further. With friends like that, give me the old Brill Building system.”

He went on, “Here’s the simple fact that no one wants to talk about. Spotify says it pays out seventy per cent of its revenues to rights holders. Well, that’s very nice, that’s lovely. But if I’m making a shoe, and it costs me a hundred dollars to make it, and the retailer is selling that shoe for ten dollars, then I don’t care if he gives me seventy per cent, I don’t care if he gives me one hundred per cent—I’m going out of business. Dead is dead.”

Cash said, “I don’t think any of us

want to make the streaming services go away. We are not Luddites. We just want to be paid fairly.”

“And we’re not going to say a model is viable unless it’s viable for the creators,” Ribot added. “I know Daniel Ek is going to do just fine. I don’t know that about the people in my band.”

“And, if the artist can’t afford to work, the music is going to suffer,” Cash added,



with feeling. “Spotify is not acting in its own self-interest by obliterating us.”

Or maybe Spotify itself will get obliterated. Apple, Amazon, and Google have recently begun to enter the on-demand streaming market. (YouTube debuts Music Key, an ad-free paid-subscription service, this week, which will include access to Google Music Play.) Spotify’s advantage, Ek maintains, is its data and its ability to analyze that information. “We’ve been doing this for years,” he said. “And what we’ve built is the largest set of data of the most engaged music customers. I think it would be really hard for anyone to come in and do what we do better. Maybe someone could lower the cost of a streaming service and make it hard for us to survive. But am I concerned that someone will build a better product? No, because they can’t.”

James McQuivey, an analyst with the Boston-based Forrester Research, is less optimistic about the company’s prospects. “Spotify has shown people value streaming,” he said, “and that means somewhere someone could use that value in a bigger chess game. Someone like an Apple or a Google is already realizing how valuable music is as a customer-engagement tool and will offer something quite similar to this, without making you pay for it, the way Amazon has included video in the Prime membership without expressly charging. And then suddenly you’ve disrupted Spotify.” He added, “If I have to say yes or no will Spotify be as big and strong as it is five years from now, the answer will be no.”

Earlier this year, Apple acquired Beats Electronics, an audio company, which had

entered the streaming business via Beats Music. It’s not yet clear what Apple wants to do with Beats. It could try to sign up Spotify holdouts like the Beatles (Taylor Swift hasn’t pulled her back catalogue from Beats, which is subscriber-only) and promote its service as more comprehensive. On the other hand, Apple faces the classic innovator’s dilemma. An Apple on-demand streaming service would undermine its iTunes downloads business. But if streaming is the future of music—and even people who fear the prospect agree that it is—Apple will need to enter the market soon. iTunes’ music sales have dropped almost fourteen per cent since the start of the year.

Apple could pose a real threat to Spotify, by pre-installing a service—iStream, maybe—on the next generation of iPhones and including the price of a subscription in the plan. Siri could be your d.j. That would insure a paying user base in the hundreds of millions almost instantly, easily eclipsing Spotify’s. And, since Apple makes money primarily from its hardware, it could afford to undercut Spotify on the price of a subscription—a scheme it is currently promoting to the labels. Of course, that would require the support of the labels, and they are Spotify’s business partners in streaming. “You might want to take a discount in a business you have equity in,” one label head told me. “You might not want to take a discount in a business you don’t have equity in. Would we subsidize Apple with no real upside for us? We did that once before. It was called unbundling the album.” In any case, the downward pressure on price from increased competition seems likely to diminish the pot of money that the rights holders get to divide.

Even if Spotify does manage to survive Apple, it will take years to complete the paradigm shift to streaming. Meanwhile, album sales will continue to decline—even albums recorded by Taylor Swift. The labels, feeling the pinch in their bottom line, may try to squeeze more money out of Spotify, imperilling its future growth. They may even try to cash in their equity stakes. Proving that, while your enemies can indeed become your friends, the reverse can also be true. ♦

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A conversation with John Seabrook.



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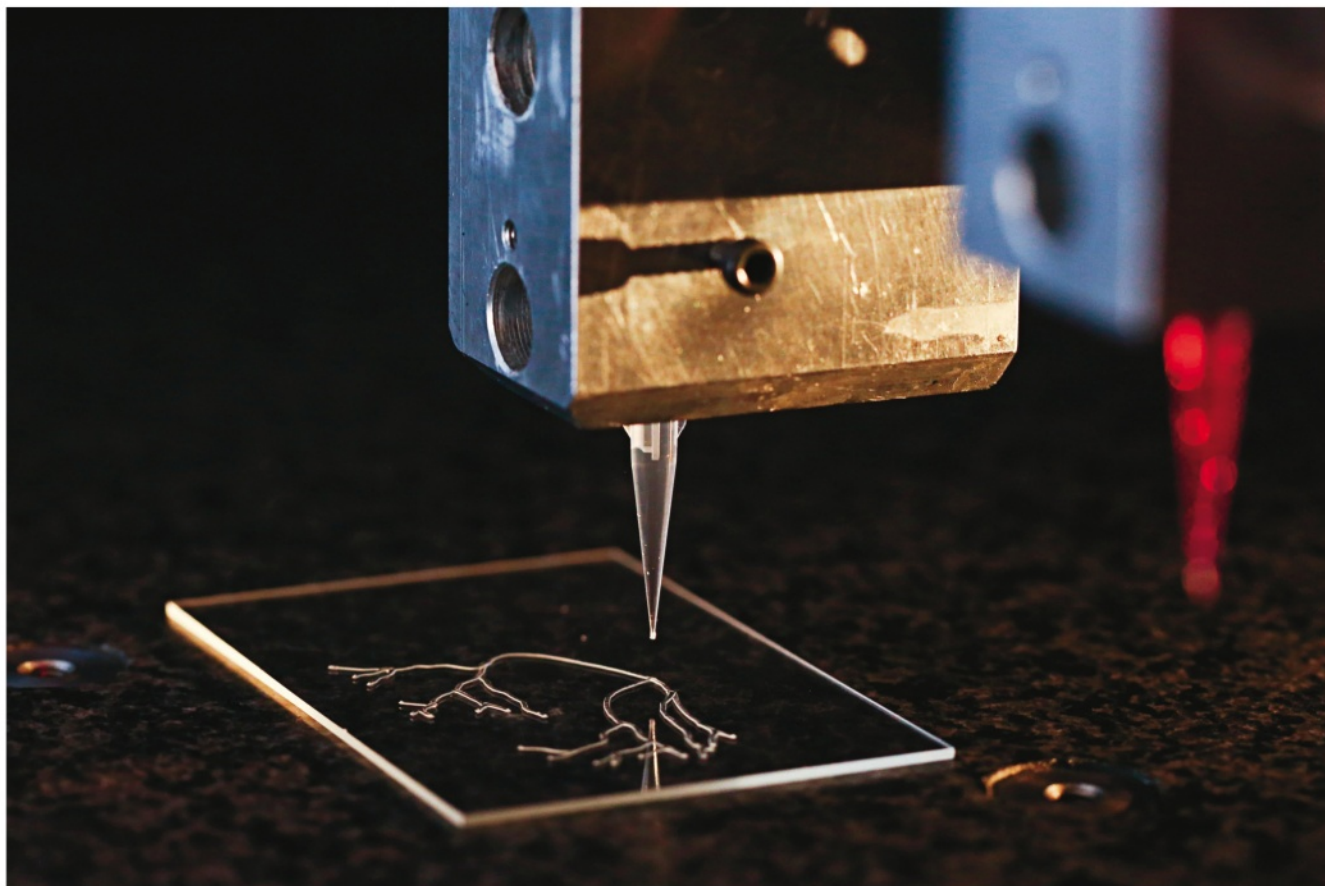
BY JEROME GROOPMAN

In February of 2012, a medical team at the University of Michigan's C. S. Mott Children's Hospital, in Ann Arbor, carried out an unusual operation on a three-month-old boy. The baby had been born with a rare condition called tracheobronchomalacia: the tissue of one portion of his airway was so weak that it persistently collapsed. This made breathing

with the baby's doctors at Akron Children's Hospital, in Ohio, and they soon agreed that they had just the right tool for this delicate, lifesaving task: a 3-D printer.

As its name suggests, a 3-D printer prints ink not on a flat substrate, such as paper, but in three dimensions, in successive layers; the ink is substrate and substance in one. The first 3-D printers were

printers have become inexpensive and ubiquitous. Staples and Amazon now offer 3-D printing services, and the list of 3-D-printed products generally available includes nuts, bolts, earbuds, eyeglasses, athletic cleats, jewelry, cremation urns, "Star Wars" figurines, architectural models, and even entire houses. In the United States, debates have erupted over whether citizens should be allowed to 3-D-print handguns at home, which the technology makes possible. Today's printers print in plastics, and also in silver, gold, and other metals, along with ceramics, wax, and even food. (NASA is working on a zero-gravity 3-D printer that can make pizza for orbiting astronauts.) For a small fee, you can upload a photograph of your face and receive back your likeness in the



A 3-D printer used by researchers at Harvard University's Wyss Institute creates a model vascular network.

very difficult, and it regularly blocked vital blood vessels nearby, including the aorta, triggering cardiac and pulmonary arrest. The infant was placed on a ventilator, while the medical team set about figuring out what to do. The area of weak tissue would somehow need to be repaired or replaced—a major and dangerous operation in so small a patient. The team consulted

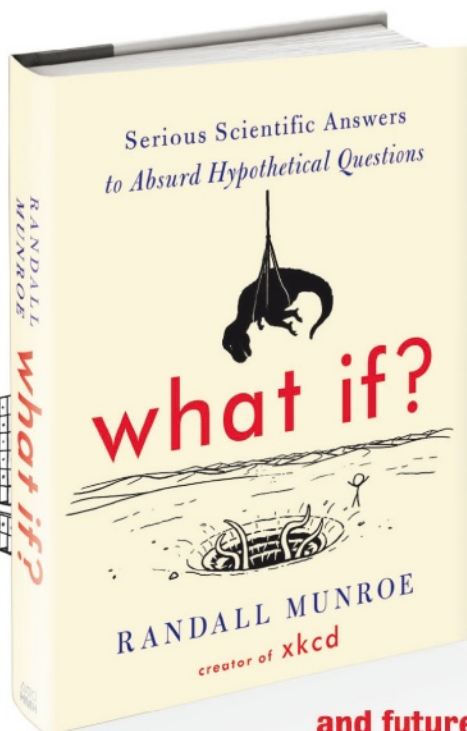
developed in the nineteen-eighties, by an American engineer named Charles Hull. The "ink" was an acrylic liquid that turned solid when exposed to ultraviolet light, typically from a laser beam. Makers of cars and airplanes could design complicated parts on a computer and then print out prototypes for manufacture; now they often print the part, too. Three-dimensional

form of a 3-D-printed bobblehead doll.

The medical procedure at the University of Michigan worked on a similar principle. The researchers began by taking a CT scan of the baby's chest, which they converted into a highly detailed, three-dimensional virtual map of his altered airways. From this model, they designed and printed a splint—a small tube, made of

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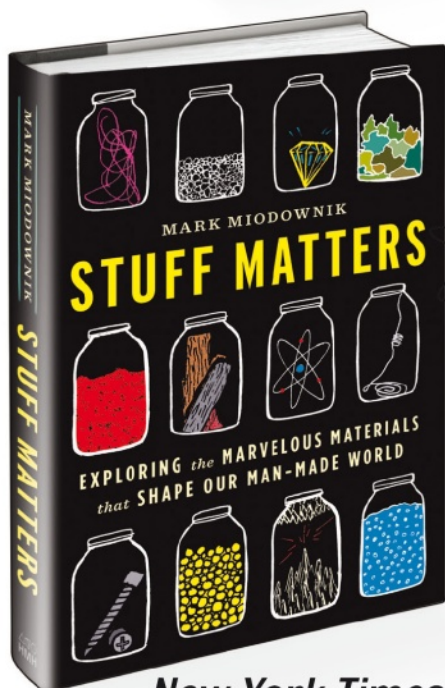
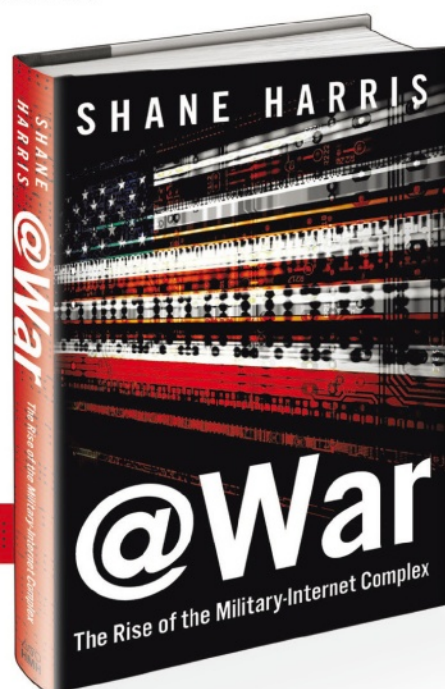
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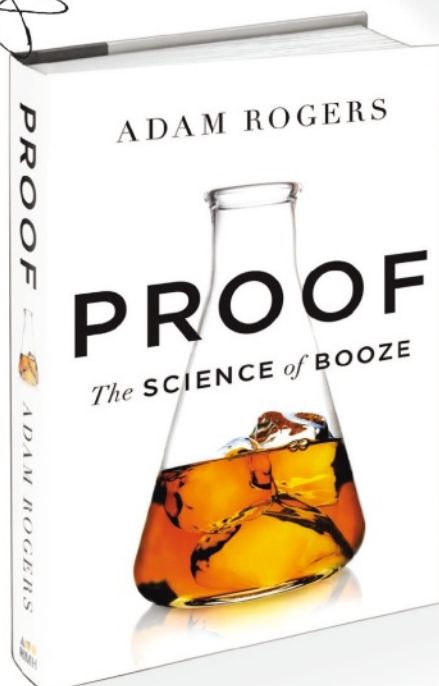
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"I just hope people in the future are, like, 'What the hell are these things?'"

the same biocompatible material that goes into sutures—that would fit snugly over the weakened section of airway and hold it open. It was strong but flexible, and would expand as the boy grew—the researchers likened it to “the hose of a vacuum cleaner.” The splint would last for three years or so, long enough for the boy’s cells to grow over it, and then would dissolve harmlessly. Three weeks after the splint was implanted, the baby was disconnected from the ventilator and sent home. In May of 2013, in *The New England Journal of Medicine*, the researchers reported that the boy was thriving and that “no unforeseen problems related to the splint have arisen.”

This sort of procedure is becoming more and more common among doctors and medical researchers. Almost every day, I receive an e-mail from my hospital’s press office describing how yet another colleague is using a 3-D printer to create an intricately realistic surgical model—of a particular patient’s mitral valve, or finger, or optic nerve—to practice on before the actual operation. Surgeons are implanting 3-D-printed stents, prosthetics, and replacement segments of human skull. The exponents of 3-D printing contend that the technology is making manufacturing more democratic; the things we are choosing to print are becoming ever more per-

sonal and intimate. This appears to be even more true in medicine: increasingly, what we are printing is ourselves.

This past June, I attended the Aspen Ideas Festival, in Colorado, which opened with a focus on innovations in health. The first speaker was Scott Summit, a tall, bearded industrial designer for a company called 3D Systems. The company was started by Charles Hull, and has since grown into one of the world’s leading purveyors of 3-D printers and services. The company contributed to the design of a popular product called Invisalign, an alternative to the metal braces used in orthodontics. Treatment begins with a scan of the patient’s bite, to determine how it might be fixed over time. Then an individualized “aligner,” which looks like a clear plastic mouth guard, is printed for the patient to wear. Periodically, the design is adjusted and a new aligner is printed, until the problem is corrected.

3D Systems has made steady inroads into the medical market. A few months ago, the company, together with researchers at Children’s Hospital Oakland, completed an early test of a new kind of spinal brace for young adults with scoliosis. To correct the disorder, the typical brace must be worn during virtually every waking hour, but most kids can’t stand to do so. “If

you look at the braces now, they press against the body,” Summit told me over the phone. “They come with Velcro straps; they’re hot in the summer. Most teenagers don’t want to walk around looking like that.” I could sympathize. Several years ago, after a spinal-fusion operation, I had to wear a similar brace for months, and the experience was torture—the brace was highly uncomfortable and impossible to disguise. Summit’s new brace looked, instead, like a formfitting lace tank top. It was made from finely ground nylon powder that had been precisely melted, then left to solidify into a filigree pattern. The end result was light, breathable, and customized to the wearer’s body and medical needs, and could be easily worn under clothing. The company tested the brace with twenty-two girls, and is working toward making it more widely available.

At Aspen, Summit appeared onstage with a forty-six-year-old wheelchair-bound woman named Amanda Boxtel. In 1992, a skiing accident left Boxtel unable to use her legs; she is now the director of Bridging Bionics, a foundation that tries to restore mobility to people who are paralyzed. In 2013, researchers at 3D Systems scanned the contours of Boxtel’s lower body and then printed snug sleeves, made of flexible nylon fibres, for her torso, thighs, and shins. They then connected these to an existing set of motorized leg braces and hand controls made by a company called Ekso Bionics. The result, in effect, is a customized exoskeleton; when Boxtel wears it—as she later did at the conference—she can slowly walk. Other motorized mobility aids exist, Summit said, but because they aren’t personally sculpted, the wearer risks getting abrasions and infections when the device puts pressure on the hips and legs. “I love my robot,” Boxtel told me later. “It was made from me and for me. But I want more. I want to think of it as my sleek and sexy sports car.”

Until fairly recently, most 3-D-printed medical devices were aimed at shoring up the human body from the outside, but, increasingly, they are being slipped into us as well. 3D Systems supplies its printing technology to a company called Conformis, which prints more than a thousand customized knee implants a year. (Although the market for customized knee implants is surging, the jury is still out on whether they provide a better

outcome than generic implants do.) Earlier this year, surgeons in Wales used a 3-D printer to reconstruct the facial bones of a twenty-nine-year-old man named Stephen Power, who fractured his left cheekbone, eye sockets, upper jaw, and skull in a motorcycle accident. The medical team scanned Power's skull and, based on the unbroken bones, determined what his full facial structure should be. They then printed a replica in titanium and successfully implanted it.

Recently, I spoke with Dr. Oren Tepper, the director of craniofacial surgery at Montefiore Medical Center, in the Bronx, who has found an innovative use for 3-D printing in his practice. In 2012, he was presented with an infant girl named Jayla, who had been born with only a rudimentary jaw. The condition made it difficult for her to breathe; the next step would have been to give her a tracheostomy. The usual solution, a full jaw reconstruction, would have required numerous, risky bone-graft surgeries and can't be performed until a child is older.

Instead, Tepper made a full CT scan of Jayla's head, and from that information arranged to have 3-D-printed a detailed plastic model of her ideal jaw. The model wouldn't replace her existing jaw; rather, Tepper would transform her existing jaw into one very similar in shape to the model. Tepper then had printed something akin to a three-dimensional stencil that fit exactly around the lower part of her face; it had slits and holes in it to indicate where he could drill without damaging her facial nerves. Finally, he attached a ratchet to her jaw; each day, he tugged her jaw forward by a millimetre, allowing her bone cells to grow and fill in the stretched region. When the whole process was complete, many weeks later, Jayla had a normal-sized jaw. Tepper now treats two or three children with similar malformations each year.

"I'm from the younger generation, comfortable with new technology," he told me. "You could try to do such a complex surgery without virtual modelling, and without 3-D printing. But it would be

much more challenging, much more risky, with much more opportunity to fail."

The biggest leap for medical 3-D printing lies ahead. For years, researchers have dreamed of engineering kidneys, livers, and other organs and tissues in the lab, so that a patient who needs a transplant doesn't have to search for a donor. But growing usable tissue in the lab is notoriously difficult; the advent of 3-D printers that can print ink made of cells has offered a ray of hope. In the early nineteen-nineties, Anthony Atala, the director of the Wake Forest Institute for Regenerative Medicine, began growing human bladder cells on biodegradable scaffolds in his lab. The cells formed a kind of pouch, which he successfully implanted around the bladders of seven children with poor bladder function, relieving their condition. That achievement was soon followed by a cascade of announcements declaring victory in the race to create a true human organ. Most of these projects involved growing tracheal cells or cardiac cells or kidney cells on polymer scaffolds, often

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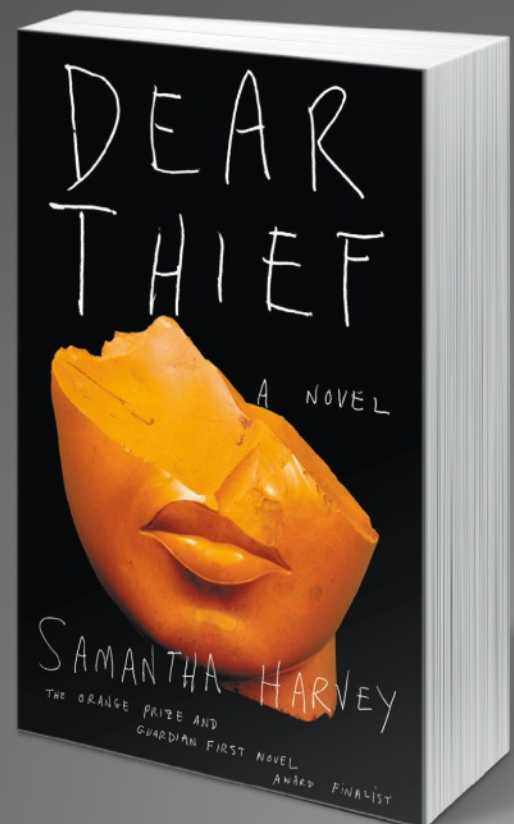
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produced with 3-D printers, but none have succeeded in growing into full-fledged organs. As scientists make more concerted efforts to grow organs in the lab, the question is no longer whether they will succeed but how.

The first microscopes were invented in the sixteenth century, around the time of the invention of the telescope. Two realms were soon revealed: the macrocosmic world of celestial bodies and the vast distances between them, and the intimate, interior world of microscopic organisms and cells. But, whereas astronomers readily grasped that the mechanics of the universe proceed in three dimensions, cell biologists often still seem stuck in a two dimensions. Partly that's a function of how most microscopes work: a specimen must be placed on a thin glass slide so that it can be illuminated from above or below. As a result, even with modern computers and mapping software, biologists struggle to understand how our cells interact with one another to form three-dimensional tissues and organs, and they've had an even harder time re-creating those geometries.

In my lab, for example, I study endothelial cells, which line the insides of our veins, arteries, and capillaries. When these cells are removed from the body, they quickly die; growing and sustaining them in a lab requires special procedures and equipment. First, the cells are placed on a plastic dish coated with a gelatinous mix of collagen and other proteins. Then the dish is placed in an incubator, which is set at a certain temperature and infused with just the right amounts of oxygen, nitrogen, carbon dioxide, and water

vapor, in an effort to approximate the ambient conditions within a living body. The cells survive for a few weeks, but I can't control how they organize themselves in the collagen matrix. I have yet to place a dish of endothelial cells in the incubator and return several days later to find a working blood vessel.

It's hard to overstate the importance of structure to the proper functioning of a biological system. Sickle-cell anemia is caused by a single, shape-altering gene mutation. The normal gene codes for a protein called globin, which helps red blood cells carry oxygen to the body's tissues. When the gene mutates, however, the resulting protein collapses on itself and can clog the blood vessels. Until recently, Alzheimer's researchers did not have reliable ways of studying how brain cells spontaneously make the abnormal amyloid proteins that are thought to be at play in the disease. Neurons raised in petri dishes simply don't behave the way they do in the brain. But in October, in an article in *Nature*, a team of scientists at Massachusetts General Hospital reported that when they grew the neurons in a gel matrix, so that the cells could interact with one another in three dimensions, they saw a far more realistic representation of the disease—a potential boon for future lab research on Alzheimer's.

Efforts to engineer tissues and organs have been similarly hampered by two-dimensional constraints. Jordan Miller, a bioengineer at Rice University, has noted that a viable replacement organ will need to be made of at least a billion working cells, of many different types. "Scaling up tissue constructs is first and foremost a

numbers game," Miller wrote recently in the journal *PLOS Biology*, in a paper titled "The Billion Cell Construct: Will Three-Dimensional Printing Get Us There?" A flat petri dish, or several of them, won't suffice; the cells need to be organized in such a way that they can exchange nutrients, growth factors, and other information.

But the expertise for wrangling such numbers, Miller wrote, "is still off by several orders of magnitude." Scientists have typically tried to address the challenge by growing different cell types atop plastic or epoxy scaffolds. These masses soon become tombs; as the cells on the outside proliferate, those on the inside, starved of nutrients and deprived of oxygen, die. One could conceivably grow billions of kidney cells, and even make them look like a kidney, but, without a growing vasculature to nourish the whole mass, the behavior of that mass will bear little resemblance to that of an actual kidney.

"This is an area that has a lot of hype," Jennifer Lewis, a materials scientist at Harvard, told me recently. "I remember the first time I saw a TED talk: I started watching the video, and the guy announced, 'We're printing a kidney!' Then he showed some material in the shape of a kidney. I thought it was misleading, printing the shape but presenting it as if it were a kidney. We don't want to give people false expectations, and it gives the field a bad name."

Lewis is fifty, with short brown hair, rimless glasses, and a friendly, focussed manner. Although she likes to dampen any expectations about the 3-D printing of organs and tissues, her work is becoming central to the emerging field. In February, Lewis and a graduate student, David Kolesky, and other members of their research group published a paper in *Advanced Materials* describing a potential way to keep large masses of cells thriving. With a customized 3-D printer, they were able to print a protein matrix and living cell types in a pattern similar to what is found in the body. Critically, they managed to create within these blocks of tissues a network of vascular channels that, much like blood vessels, can deliver nutrients to the cells and keep them alive. It isn't 3-D-printed organs, but it is a vital advance toward that goal. "We call it 3-D



"You're getting a legendary desk. Some of these cords go back six, seven managers ago."

bioprinting,” Lewis told me, with an emphasis on “bio.”

Lewis grew up in Palatine, Illinois, and went to college at the University of Illinois at Urbana-Champaign. As a freshman, she was recruited into the ceramic-engineering program; she stayed with it and eventually, at M.I.T., got her doctorate in ceramics science. Lewis said that she likes ceramics for their unusual properties. They can form glass, porcelain, and clay, but they also readily conduct electricity and are a key material in many high-tech electronics.

“Ceramics processing has always been part science, part art,” she told me. “What I found most fascinating was that a given material’s properties can vary widely depending on how it is assembled.” She added, “I fell in love with the idea of creating matter that matters.”

In 1990, Lewis returned to Urbana-Champaign to teach, and began to work on 3-D printing, which she considered the perfect tool for constructing materi-

als “voxel by voxel”—volume element by volume element. “If you think about 3-D printing thirty years ago, it was focussed on ultraviolet-curable resins, or thermoplastics, and it was largely a prototyping tool to make shapes or forms,” she said. “I wanted to create functional materials and devices, rather than simply making prototypes.”

In 2001, she began collaborating with Scott White, an accomplished materials engineer who for years had been working to create plastics and other building materials that would mend themselves when damaged. White told me that the kinds of cracks that can compromise the plastic or metal components in a car or an airplane typically occur within the material and aren’t easily detected from the outside. White and his colleague Nancy Sottos had found a multi-step solution to the problem. First, with a 3-D printer, they created materials populated with microcapsules that, in turn, were filled with special healing agents; as the material suffered

wear and tear, the microcapsules would break open and release their contents. The contents were monomers, simple plastic molecules that, when they encountered a certain other chemical that was embedded in the material, would react to fill a potential crack.

Second, once Lewis joined the team, the researchers realized that the material should have microchannels in it, so that the healing agents could more easily reach the cracks, just as clotting proteins and platelets in the body travel through capillaries to reach and heal open wounds. At first, they used a wax-based ink that would melt when heated. In 2011, Lewis went about developing Pluronic ink—a material that is gelatinous at room temperature but, counter-intuitively, turns to a liquid when it is cooled to just above freezing. With their 3-D printer, Lewis and White could then make plastic objects that were embedded with intricate networks of the Pluronic-ink gel. Afterward, the object could be cooled down and the liquified

THE MARKETS CRASHED AND MY ASPIRATIONS SOARED.

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ink could be sucked out, leaving a nexus of channels. For this reason, Lewis often refers to the material as "fugitive ink."

"It's a bio-inspired approach to creating materials that can heal themselves," Lewis said. "My big role in the project was to find ways to use 3-D printing to embed this microvascular network. Once we did that, it was pretty easy for me to see the broader implications."

In 2013, Lewis left Urbana-Champaign and took up a faculty post at Harvard, doing research at the Wyss Institute for Biologically Inspired Engineering. Her laboratory has several dozen undergraduates and graduate students working in it and occupies the better part of a new concrete-and-glass building on a quiet street just north of the main campus. Central to the lab's work are three customized 3-D printers, each worth a quarter of a million dollars. When I visited Lewis in September, I told her I was eager to see one.

Lewis led me through a warren of corridors and offices to a room where one of the printers sat on supports. It was immense. The base of the printer was a granite block five feet long, four feet deep, and a foot high, weighing a ton and a half. The printer does such fine-scale work that a stable base is essential, Lewis said. Resting on the block was a flat stage or platform, above which, in a vertical row, stood four rectangular steel containers, each a foot or so tall—the ink dispensers. They resembled the tubes of nuts in the bulk-foods section of the grocery store, although each of these dispensers ended at the bottom in a small, conical plastic tip, like that of a pipette. A tangle of colored wires connected the dispensers to some machinery behind them, and each dispenser was controlled at the top by a robotic arm. To the side sat a large monitor and a computer, which controlled the printer.

Each dispenser contained a different biological material, Lewis explained. One held an aqueous suspension of chemically treated collagen, which serves as the matrix on which many of the body's tissues take shape. Two others held suspensions of fibroblasts, the gristly cells that form the body's connective tissue. (The fibroblasts were harvested from discarded neonatal foreskins, which many hospitals save for use in research.) The last dispenser contained the fugitive ink that Lewis had developed to create channels within materi-

als. David Kolesky, the graduate student who was working with Lewis, then demonstrated how it all worked.

First, he placed a clean glass slide on the platform, under one of the dispensers. On the computer, he called up a software program and found an image representing the block of tissue that he would be printing. It looked like a rectangle of semiclear gelatin, within which was a vascular network: a channel entered at one end and branched into smaller vessels, which looped around and ultimately joined back into a single vessel that exited at the other end. It was a simple network, approximating the way that an artery divides into smaller capillaries that eventually recombine into a vein. "You can design whatever vascular pattern you want," Kolesky said. He showed me another slide, with a more complex branching pattern; it looked like a leafless tree branch. I recognized it: it was modelled on the pattern of blood vessels that supply oxygen and nutrients to the surface of the heart.

Then Kolesky hit "Run." The dispenser with the fugitive ink moved quickly and almost imperceptibly, releasing an exceptionally thin stream of what looked like agar onto the glass slide. The printer clacked and clattered like a busy riveting machine. In a minute or so, the job was done; the printer had left a trail of gelatinous ink that exactly matched the pattern on the computer. The stream of ink was about a tenth of a millimetre in diameter, and the entire pattern covered an area a little larger than a matchbook.

The printer wasn't rigged to finish the job, but Kolesky explained what would typically happen next. The other ink dispensers would take their turn, laying down a lattice of collagen and fibroblasts that would solidify around the network of fugitive ink, encasing it in tan-colored living tissue. To drain the fugitive ink, Kolesky would place the tissue on a chilled stone cube; this would cause the ink to change from a gel to a liquid, after which he could then extract it with a small suction device. The end result would be a block of living tissue suffused with intricate vessels capable of carrying nutrients to the cells within.

The last step was to me the most remarkable. Once the vessels were empty, Kolesky would take a suspension of endothelial cells—the cells that line the insides of blood vessels—and inject it into the vessel network. The cells would settle in and

multiply to line the insides of the channels, effectively turning the channels into blood vessels. And then the cells would spread—they would begin to branch off the existing vessels and form new ones. In effect, Lewis and her team have created an environment that the cells consider home—it is far more natural to them than a petri dish or the inorganic scaffolds that had previously played host to cultured tissues.

"I like to say that we design the highway and then get out of the way and let the endothelial cells create their own driveways," Lewis said. "It's better to rely on the intelligence of the cells themselves in terms of how they like to sprout."

Lewis's approach is only one of many in the wider effort to create complex tissues. A team of researchers from Brigham and Women's Hospital and Carnegie Mellon University are working toward building a magnetically controlled "micro-robot" that can arrange cells in pre-specified structures. Other groups, at Boston University, Rice University, and at M.I.T., are pursuing ways of

3-D-printing vascular channels using a sugar-based ink. "I think it's wonderful," Jordan Miller, of Rice, said of Lewis's work. "She is a world leader."

For her part, Lewis is passionate about the changes that 3-D printing could bring to the pharmaceutical industry. Billions of dollars each year are spent on drug development that fails. If bioprinted tissues were readily available, experimental drugs could be tested on them to see how the drugs are metabolized and what side effects result. "We want to provide a fail-fast model," Lewis said, "so that drugs can be assessed in 3-D human tissue and their toxic properties identified before spending money and effort in animal and human testing."

But Lewis admits that she does think about the prospect of printing whole, functioning organs. "The grand challenge is to make a whole kidney—that is our moon shot," she said. The first step would be to make a nephron, the fundamental filtering unit of a kidney. She noted that her team has already demonstrated the ability to print any pattern of vascular

channels that it wants; the blood-vessel patterns of a nephron are just one more option. And recently the team found a way to line channels with epithelial cells taken from human kidneys. "We see this as a ladder, one step following the next," she said. "Creating just a single nephron would be a great achievement. But there are a million in each kidney."

Before I left the lab, Kolesky showed me the incubator, a white box near the printer that was about the size of a dorm-room refrigerator. He opened the door. On a shelf, on a glass slide, was a finished block of printed tissue. A fine plastic tube, the size of a strand of spaghetti, entered it at one end, delivering glucose, amino acids, and other critical nutrients. Another spaghetti-like tube emerged from the other end, carrying off carbon dioxide, broken-down proteins, and other cellular waste. The tissue had been alive for the past two weeks, Kolesky said. There wasn't much to see, but the tissue was thriving, and it looked to me like the start of something very big. ♦

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THE SPORTING SCENE

GOOD GAME

The rise of the professional cyber athlete.

BY BEN MCGRATH

I confess to being bewildered, still, by what is often said to be the greatest game of StarCraft II ever played. Fall, 2013. New York's Hammerstein Ballroom. Scarlett vs. Bomber. Third game in a best-of-three series, a quarter-final in a tournament sponsored by Red Bull. It lasted about forty minutes, although I gathered, from the live commentary on the video that I have watched many times, that it nearly ended far sooner. A couple of minutes in, there came this exchange:

"Uh-oh. Oh, my God! Scarlett is going gas!"

"Oh—oh, God!"

"Gas pool! And it's a double proxy. Bomber is walking into the worst possible situation."

StarCraft, a video game, is often compared to chess: it is strategic and extremely difficult, requiring a mathematical cast of mind, and, unlike many other video games, with their scrolling or first-person vantages, it affords a bird's-eye perspective of the board, or map. But the analogy breaks down in countless ways. The map changes from game to game. (In this instance, it was called Habitation Station, and shaped somewhat like a butterfly.) Instead of black or white, players choose from among three "races," called Zerg, Terran, and Protoss, with different strengths and vulnerabilities. In the early stages, players cannot see one another's armies, and must dispatch scouts to illuminate darkened corners; they must also develop economies, with which to fund the inevitable battles. It's as if Garry Kasparov had to plot a pawnless endgame while simultaneously harvesting minerals, building fuel extractors, and searching in vain for Spassky's queen. Academic researchers now use StarCraft II—the "drosophila" of brain science, as one paper suggested—when studying people who expertly perform cognitively complex tasks. Chess may soon be eclipsed as the standard-bearer of competitive I.Q.

"Imagine playing a concerto on a piano,

and if you miss one note the entire orchestra stops playing and you're kicked off and you lose your job," Sean Plott, one of the official commentators on the Scarlett-Bomber match, told me recently. "That's what this is like." The piano reference was not arbitrary; top-level StarCraft requires as many as three hundred actions per minute, or A.P.M.; an elite practitioner's left hand, as it manipulates the keyboard, can appear almost to be playing Chopin. The right hand, meanwhile, darts and clicks with a mouse, contrapuntally, so frantic that carpal-tunnel syndrome and tendinitis are common side effects.

But that's not what I was seeing as I reviewed the historic footage. I saw blue robo-soldiers (Bomber's Terran marines) and red, buglike creatures (Scarlett's Zerglings) scurrying around an apocalyptic space station—which seemed, despite the absence of any natural light, to be sprouting green shrubbery. Occasionally, the marines were flanked by friends (reapers) who appeared to be wearing jet packs. With time, the red bugs received assistance from winged dragons flying in formation—mutalisks, or "mutas." Red was fast. Blue was heavily armed. Firefights broke out every so often, seldom lasting more than five or ten seconds before one side retreated to focus efforts elsewhere and keep its army intact—the micro game ceding to the macro, in the parlance.

There is no definitive scoreboard, just a variety of economic indicators, which describe potential rather than success. Comebacks are not as straightforward as in, say, baseball, where a run is a run and play starts anew each inning. Economic advantages compound, and an early lead is more likely to be extended than merely clung to, let alone overcome. The ultimate goal, of course, is to annihilate one's opponent, yet tradition and courtesy frown on drawing out the inevitable, and a loser who fights to the last is not being courageous but wasting everyone's time. When the situation grows dire, the weaker player

is expected to type "gg," meaning "Good game"—a white flag.

Back to the broadcast: "This is looking increasingly excellent for Bomber right now." We were a little more than a dozen minutes deep, and the momentum had reversed completely, such that the commentators would soon be discussing Scarlett's "terrible situation." So much for that vaunted gas pool. During our recent conversation, Plott explained to me that Scarlett is notorious for "carefully sneaking around these huge, possibly game-ending mistakes, and she's so close, and you want to yell at her, like, 'Stop it! Either attack or don't!' But she's utterly patient." Watching the game unfold, I couldn't discern what those mistakes might be, but I detected a ratcheting up of anticipation in the crowd's reactions, and in the commentators' tone, and gathered that she had skirted danger successfully. Past the half-hour mark now, and a poll of the audience indicated a fifty-fifty split: anyone's game.

Scarlett began dropping domed pods near land bridges and other choke points, while fending off Bomber's steady marine assaults. This was a patient strategy with, as it turned out, an explosive payoff. The pods were "burrowed banelings"—suicidal fluorescent creatures, lying in wait, like land mines. Bomber couldn't see them, and his marines marched right into her trap, lured by the fleeing bugs.

Gg.

At last, the camera pulled back and showed human beings, on a stage. Scarlett, whose real name is Sasha Hostyn, leaped out of her seat—for the first time in her career—and took a bow before a standing ovation from the two thousand paying customers (and, perhaps, from the fifty thousand viewers watching online). Bomber, or Choi Ji Sung, hustled off without a handshake. Soon, the victor—lean, blinking, with a frizzy blond ponytail—was draping the flag of her native Canada around her green hoodie, while the besuited postgame analysts continued



Scarlett, the most accomplished woman in e-sports, is known for her macro mutalisk style and kick-ass creep spread.

PHOTOGRAPH BY JENNY HUESTON

THE NEW YORKER, NOVEMBER 24, 2014

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to look agog at their desks, as though the moon had just rained candy. Two reasons for everyone's astonishment: Scarlett was neither from South Korea, where *StarCraft* has rivalled baseball in popularity, nor a young man, like all the other top players. Korean Kryptonite, she has been called. The most accomplished woman in the young history of electronic sports.

It's not a sport," John Skipper, the president of ESPN and, by extension, the emperor of contemporary sports, has declared, referring to gaming in general. "It's a competition." He added, "Mostly, I'm interested in doing real sports." That "mostly" was an acknowledgment that the network has nonetheless begun hedging its bet against a cyber-athlete insurgency. In July, ESPN2 aired a half-hour program previewing an annual tournament for a game called *Defense of the Ancients 2*, or *Dota 2*, thereby enraging football and basketball fans who would have preferred round-the-clock speculation about off-season roster moves, and who vented on Twitter: "None of these people are anywhere near athletic," "Wtf man. This is our society now," "WHAT THE HELL IS HAPPENING ON ESPN2?," and so on. Meanwhile, the winners of the *Dota 2* tournament took home a total of five million dollars.

A month earlier, in June, I had my own first exposure to gaming-as-sport, at an ESPN event: the X Games, in Austin. It was an inadvertent discovery. I had gone to see the skateboarders and BMXers, so-called action-sports stars, and found that many of them were incredulous at being asked to keep company with joystick jockeys. For the first time, X Games medals were being awarded for Xbox proficiency. There was a pleasing irony in the circularity of the kvetching. Here were traditional outsiders, some of them outspoken victims of childhood bullying, who, twenty years ago, were dismissed by the jock establishment for bringing their alternative fashion sense and disaffected miens to an Olympic-style competition. And now, secure with their corporate sponsors and honorary square jaws, they, in turn, were sneering at a new breed of outsider arrivistes: nerds!

The federal government disagrees with ESPN's Skipper. As of last year, gamers of international renown are eligible for P1-A exemptions, otherwise

known as "athlete visas." Robert Morris University, in Illinois, has added *League of Legends*, a "multiplayer online battle arena" game, as a varsity team sport, and this semester the program began awarding athletic scholarships. Last month, Major League Gaming, a New York-based organization, opened a small arena in Columbus, Ohio, with bleacher seating and broadcast booths, to capitalize on the region's college demographic.

The X Gamesmen played *Call of Duty*, which I've come to understand as the most conventionally sporty of the genre, judging partly by its contestants' appearance. These were nerds who could pass for bros on a dorm-room sofa—not an accident, given that *CoD*, as insiders call it, is typically played on a console (Xbox, PlayStation, etc.) rather than on a personal computer. It's a fraternity staple. The *CoD* stars bumped fists and popped their jerseys, like basketball players. (Unlike *StarCraft*, *CoD*'s competitive circuit functions as a team game, with four on a side, working in concert to shoot bad guys.) My subsequent investigation leads me to believe that *CoD* players are the most likely to post muscly pictures of themselves on Instagram—they're the proudest of their guns. Among the leading e-sports, this is the game at which Americans generally perform the best.

CoD is a first-person shooter, a category of game whose defining characteristic is its point of view: that of an individual looking down the barrel of an assault rifle. It also includes titles like *Halo*, *Counter-Strike*, *Doom*, and *Quake*—the last responsible for a seminal moment in the evolution of gaming from antisocial diversion to gainful employment. This occurred in 1997, during a *Quake* tournament called *Red Annihilation*, by some accounts the first video-game competition to be held on a national scale. The winner, a nineteen-year-old Californian named Dennis Fong, was rewarded with a Ferrari that belonged to one of the game's creators, John Carmack. More than any cash prize, Carmack's Ferrari lingered in prospective gamers' imaginations, a sign that a quick virtual trigger finger was a transferable skill with IRL perks. It even impressed Mom and Dad: "The biggest value was in getting my parents off my back," Fong recalled recently. Fong, whose *Quake* handle was *Thresh* (short for "threshold of pain"), is credited by Guin-

ness with being the world's first professional gamer.

The drawback of first-person shooters, from a sports fan's perspective, is their "observability." The graphics are often cinematic, but it's difficult for a spectator to have any sense of the competition—to impose narrative drama—if he can see the battlefield through the eyes of only one soldier at a time. *StarCraft*, which is classified as a real-time strategy game, or R.T.S., was released in 1998, and avoided that problem with its top-down perspective. Its graphics were modest, but, in a way, that, too, was a virtue, because the game could be played on any old computer, regardless of processing power. It quickly grew popular in South Korea, where the government was investing heavily in broadband as part of a modernizing push in the wake of the Asian financial crisis. Gaming cafés, known as PC bangs, had become the default after-school hangout for teen-agers in Seoul, and *StarCraft* was the new pickup hoops or sandlot ball.

No jock chauvinists, the South Korean Ministry of Culture, Sports, and Tourism legitimized the new pastime, in 2000, with the formation of an official organization to nurture and provide structure for the burgeoning scene: KeSPA, the Korea e-Sports Association. Professional leagues were established. The country's biggest corporations sponsored teams (as they do in baseball) and provided houses for players to live and train in. Two television channels were dedicated to broadcasting and analyzing games, and the Proleague final in 2004 drew a crowd of a hundred thousand to the beach in Busan. By the end of the decade, the surest sign of success had arrived, in the form of gamblers, and e-sports had their first match-fixing controversy.

Unlike, say, baseball, *StarCraft* was also a commercial product, the intellectual property of Blizzard Entertainment, based in Southern California. Blizzard wasn't making money off professional broadcasts in an already saturated Korean market, so it produced a sequel, arguably the first video game designed specifically with its potential as a sport in mind. *StarCraft II* launched in 2010, around the same time that streaming technology was becoming fast enough to allow enthusiasts in Kansas and Stockholm to watch, and learn from, the heroes of Seoul.

The utopian promise of e-sports as a global meritocracy, open to anyone with an Internet connection, no matter your weight, your scoliosis, or your gender, suddenly seemed within reach. Who needs ESPN, anyway? You can find nearly any match or tournament you want to see on the game-streaming site Twitch.tv, which Amazon acquired three months ago for just shy of a billion dollars.

The front-desk clerk at my hotel in Kingston, Ontario, asked what had brought me to town, and when I said that I'd come to interview a pro gamer she didn't look bemused, as I'd thought she might. "Don't tell that to my son," she said. "He's ranked fifty-sixth in Call of Duty. I just want him to finish school."

Kingston, a city of a hundred and twenty thousand, is where Sasha Hostyn, a.k.a. Scarlett, grew up. Her father, Rob Harrap, is a geology professor at Queen's University; her mother, Joyce Hostyn, a committed Xeriscapist, has worked in public radio, politics, and software design. Sasha is now twenty. She and her older brother, Sean, who is twenty-two and studying math and computer science, refer to their parents as Rob and Joyce. It's a progressive family in a number of ways. Sasha uses her mother's last name; Sean uses his father's. Rob and Joyce practiced what they call "unbundled parenting," with respect to their children's education, beginning at the age of twelve. "You treat kids like infants all their lives, and then one day, when they turn eighteen, you expect them to leave the house and act like adults?" Rob said. "That doesn't make any sense." He said that he'd never seen Sasha's high-school transcript and, therefore, could only guess about her best subjects. Joyce told me that last year, when Sasha was nineteen and already the most highly regarded StarCraft II player in North America, she mentioned, in passing, that one of her teachers in junior high had recommended that she get involved in extracurricular math competitions. It was the first Joyce had heard of it.

Not that they didn't know that Sasha was analytically inclined. The family played card games (Magic: The Gathering, not Go Fish) and board games (Carcassonne, not Monopoly) obsessively—and "pretty much since birth," Rob said. Sasha was a predictable winner, and the three others competed for second place.

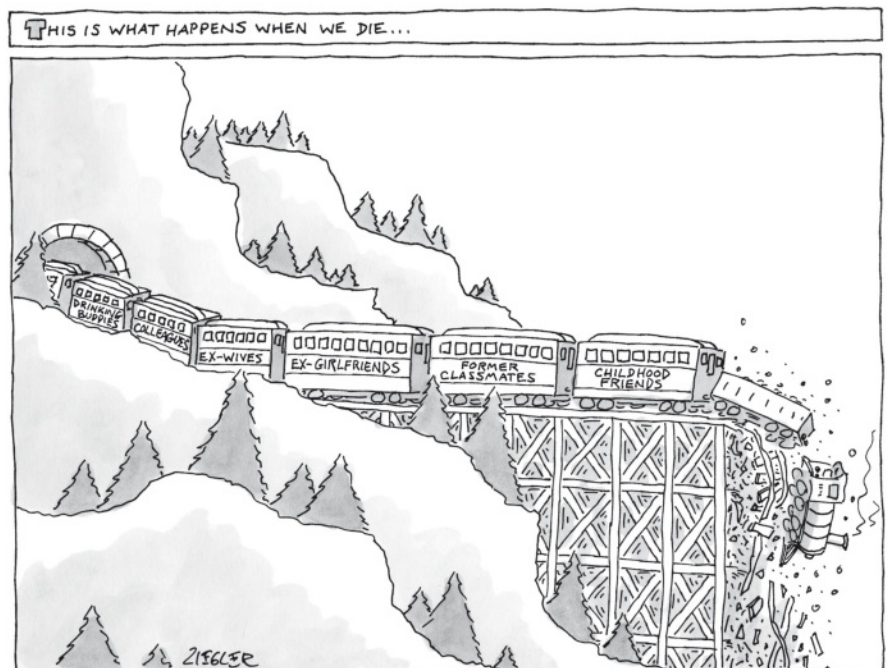
When the kids were six and eight, respectively, they expressed a desire to learn Mandarin, and when they were eleven and thirteen their parents rewarded their efforts with a family trip to China. Shortly after arriving, Sasha took an interest in xiangqi, or Chinese chess, whose pieces and rules are different from those of the Western game. They got a travel set, and one day, at a restaurant in Lijiang, Sasha challenged the waiter. A crowd gathered to watch as the eleven-year-old foreigner dominated. For local pride's sake, a native expert had to be summoned from nearby to eke out a victory over the kid.

Rob was an old-time gamer, with roots in the text-based computer games of the nineteen-seventies, like Adventure and Star Trek. "It was considered the cultural kiss of death to admit that you were a role player," he said, referring to games like Dungeons & Dragons, which he also enjoyed. "But computer games were O.K., as long as you didn't talk about them too much." He and Joyce introduced the kids gradually: no more than half an hour a day, at first, and then an hour. First-person shooters were forbidden. (Sasha played them anyway, when Rob and Joyce weren't home.) "I'm not sure why I can defend StarCraft," Rob said, and began trying to articulate a moral justification having to do with the abstraction of the bird's-eye view and the obviously fictional presence of aliens and super-bugs. In 1998, after the original StarCraft came out, Rob cre-

ated a local network using the family's three computers, so that he and the kids could play together. Rob blew up one of Sasha's bases, and the wounded five-year-old went running down the hall yelling, "He nuked my base! He nuked my base!" Joyce scolded Rob for bringing violence into the household.

Sasha wasn't much interested in traditional sports—only skiing. The family did notice an early propensity to zip straight down the mountain, without stopping, using a kind of tunnel-vision focus that proved beneficial in young adulthood. While bored in high school, Sasha played the stock market, day-trading surreptitiously on an iPod Touch. Sean was the first in the family to get interested in following the professional StarCraft scene in Korea, and also the first to play it seriously. Sasha took up StarCraft II six months after Sean—and beat him within two weeks. Sean, Sasha told me, is quite a good gamer, but he stopped playing StarCraft II regularly a while ago. Rob plays StarCraft II several hours a week, and estimates his A.P.M. at fifty-five: solidly mediocre.

I mention all this because Sasha faced little of the usual parental skepticism as she began to contemplate postponing college in favor of a video game. "I don't believe that kids have to do a traditional career," Joyce said. Rob said, "I don't see this as any different from somebody going backpacking for two years after



high school.” Nonetheless, he was concerned about competitive gaming on two counts. “You can play basketball in a local league, and that’s a legitimate thing,” he said. “But I don’t see as much of that in e-sports. It’s, like, you went out to play basketball on the playground, and everybody laughs at you because you’re not Michael Jordan. People mock anybody who’s sort of second tier.” The ruthless objectivity—a mother referring to her son as “fifty-sixth in Call of Duty,” rather than as very good, perhaps even better than anyone for miles around—seemed a recipe for ego destruction.

Perhaps more important, as an academic Rob had been a longtime observer of online communities, with their anonymous sniping and trolling. He was one of the first few hundred people to create an account on the social-networking site Reddit, and still recalled the coarsening of the site’s tone as its user base expanded beyond programmer geeks. “I knew that small communities are pretty good, and big ones get toxic,” he said. Twitch, the streaming site, is notorious for its chat function, a perpetually updating sidebar to the Zerg-on-Protoss action; it’s a window into the id of e-sports fandom. “The Twitch chat is toxic,” Rob told me. “The little I’ve watched is horrific.” He added, “I was talking to a baseball fan, and he said baseball fans were just as nasty. I don’t know if that’s true. I don’t want to look under that rock.”

The toxicity of gaming culture, with its adolescent sexuality and its tendency toward misogyny, was of particular relevance in Scarlett’s case. Shortly after she turned pro, word got out on the Internet that she was a transgender woman. (She won’t discuss the subject with journalists, as she feels that it has no bearing on her role in gaming.)

That was in early April of 2012, about a year after she began playing the game casually, and about a month after a controversy arose in a coarser corner of the e-sports world, when a prominent Street Fighter personality named Aris Bakhtanians was asked by a Twitch employee, Jared Rea, whether the fighting-game community’s habits of using vulgar and, in some cases, hostile language toward women could be tamped down. As Rea put it, “Can I get my Street Fighter without sexual harassment?”

BY THE WATERS OF THE LLOBREGAT

Two women and a small girl—
perhaps three or four years old—resting
in the shade of the fir trees.

From far off the roar of the world
coming back one more time.
First a few words tossed back

and forth between awakening men
and then the machines
talking to themselves in the language

they share with the heavenly bodies—
planets, dust motes, distant solar systems—
that know what needs to be

done and do it. So long ago,
you think, those days, so unlike these,
blessed by favorable winds

and forgotten in the anthems
we hummed on the long walk home
from work or the childish fables

Bakhtanians replied, “You can’t, because they’re one and the same thing. This is a community that’s, you know, fifteen or twenty years old, and the sexual harassment is part of a culture, and if you remove that from the fighting-game community it’s not the fighting-game community—it’s StarCraft.”

Scarlett’s previous experience with StarCraft had been strictly online, with a weak laptop and a slow connection, though a lifetime of playing games had hardened her to “people saying stupid stuff,” as she told me.

Lately, some of that stupid stuff has escalated into what is known as GamerGate. This controversy arose after a jilted gamer wrote an online screed accusing his ex-girlfriend, a game designer, of trading sex for favorable press coverage. Hordes of angry young men turned their pitchforks on women (and feminist supporters) throughout the gaming industry, in some cases threatening them. A bomb threat was sent to organizers of the Game Developers Choice Awards, because they planned to honor Anita Sarkeesian, a feminist media critic.

When I met Sue Lee, a.k.a. Smix, a Korean-American friend of Scarlett’s,

who is a frequent translator and liaison to players at StarCraft tournaments, she described her anxieties about getting involved in such a male-dominated genre. “I definitely felt that I had to be very conscious of the things I wore, especially in the beginning,” Lee said. “Because I feel like when there’s a new girl that enters the picture people are immediately skeptical. They immediately doubt the girl’s intentions. They always wonder, Is this girl here because she actually likes the game, or is she doing this because she is an attention—O.K., I was going to say ‘attention whore,’ but . . .” Lee mentioned that she would always wear long pants and a long-sleeved shirt, and resisted dancing at tournament after-parties. “It’s been three years now,” she said. “So hopefully people can’t question my love for the game.”

Scarlett first proved herself in March of 2012, when she won an amateur online tournament, the prize being an all-expenses-paid trip to an invitational in Las Vegas. And there, at the Cosmopolitan Hotel, she made her in-person debut, advancing to the sixth round. Along the way, she upset some known professionals, and even took a game against a Korean stud

we tried to believe. No one notices
the small girl and her caretakers
are gone and no one huddles

in the shade of the fir trees.
The air, brilliant and calm, stays
to witness, the single cloud lost

between heaven and here stays,
the mountains look down and keep
their distance, somewhere far off

the sea goes on working for itself.
By the waters of the Llobregat
no one sits down to weep for the children

of the world, by the Ebro, the Tagus,
the Guadalquivir, by the waters
of the world no one sits down and weeps.

—Philip Levine

named Oz, sparking a global e-sports frenzy:

From Greece: "This girl is obviously amazing."

France: "Amazing macro, still sloppy on army control it's extremely promising!"

Germany: "Holy Macaroni, never got that excited about a win since HasuObs defeated Huk!"

United States: "We can use the word 'prodigy' here without much hyperbole, I think."

Canada: "esports needs miracles like this."

In the rush to discover more about this new sensation, a few people noticed that the previous fall she'd entered—and won, easily—a couple of Iron Lady events, women-only tournaments organized online by the Electronic Sports League. No fair, some argued, apparently believing that StarCraft players, like sprinters, should be segregated by degrees of testosterone. The tournaments' director, pHaRSiDE, wasn't buying it. "Transgender girls have been competing in Iron Lady since the start of the tournament series," he wrote. "No one seemed to care until Scarlett started winning. So it's kinda funny how people only want to ban transgender girls who are incredibly good."

Scarlett's star continued to rise. She

was awarded a new nickname: the Queen of Blades, a reference to Sarah Kerrigan, the fictional heroine turned villain at the heart of StarCraft's backstory. Scarlett didn't like the nickname, however flattering its intentions, because it felt too obvious. Kerrigan is the only female character associated with Zerg, Scarlett's race of choice, and the association reminded her of the way she was too often perceived: as the token female, the outsider, not as a fierce competitor with a kick-ass creep spread.

By September, she was the North American champion and competing against elite Scandinavians and Ukrainians for a different sort of outsider mantle: that of the best "foreigner," the word StarCraft fans use to describe anyone who is not Korean.

I had my first live Scarlett sighting a couple of months ago, in Washington, D.C. It was the conclusion of the Red Bull Battle Grounds series, this year's version of the tournament at which Scarlett's burrowed banelings gg'd Bomber to such momentous effect. (After winning that game, she'd finished third, receiving six thousand dollars.) Her hair was dyed ma-

genta, matching the paint on her fingernails, and cut asymmetrically short, with heavy bangs landing in front of her blue-gray eyes. This was a relatively new do, and I'd seen it discussed amply on the Web. Verdict: thumbs-up! Tall and slim, she was dressed in cutoff jeans, Chuck Taylors, a shirt bearing the logo of Team Acer (her sponsor), and a studded black infantry cap that she'd bought in Seoul a few weeks earlier, near the end of a five-month residency there—her second such stint abroad. This, I gathered, was one of the ironies of e-sports: because fractions of a second matter, so does your physical location. Connection speeds vary. Geography is destiny. From eastern Canada, Scarlett was able to play on the game's North American and European servers, but not on the Korean server, where she might meet the most worthy practice opponents. So in order to get better she had to pack her bags.

We were at a noisy D.C. bar, for an official pre-tournament meet and greet. The commentator (or "caster") Sean Plott, who is better known as Day9, and is arguably the most beloved figure in StarCraft, if not all of e-sports, introduced us. (We'd been in touch over the computer.) "I'm very shy, usually—or I used to be shy," she said, and agreed to meet me again later on in the tournament.

After that brief conversation, other people in the bar began looking at me with newfound respect. A consultation with Scarlett, I was told, is "as rare as a unicorn spotting in the wild." She is not just introverted (like many gamers) and shy (more than most); she sometimes pauses for what seems like ten seconds before answering even a basic question, and brings her left hand instinctively to her mouth, as if to catch any words that might threaten to escape. This gives her mystique, and she seems to know it. ("She's sort of playfully rude," Day9 told me.) The less she says, the more people want to hear.

It has always been thus. Her mother, Joyce, told me that kids used to tease Sasha on the school bus for inexplicably "powering down": eyes closed, chin to chest, for minutes at a time. Joyce said that Sean, Sasha's older brother, came up with the idea that this was instead powering up, because Sasha would inevitably snap out of it with something insightful to say. "I've always been pretty good at

solving problems,” Sean told Joyce. “But Sasha’s really good at identifying what the problems are.”

When I told an old friend who follows professional StarCraft that I might be writing about Scarlett, he sent me a precautionary video link. It shows Day9 interrupting an interview with Scarlett to provide some lighthearted coaching. “Make her give long answers,” he says. “I’m always, like, ‘Scarlett, this is an important match, how do you feel?’ ‘I feel fine.’ ‘Do you have anything to say? This person just called you a piece of shit.’ ‘Oh, well, good luck.’” Occasionally, the camera pans over to Scarlett, who is seated and seems amused by his frustration. At one point, Day9 says, “Don’t you want to do this for a living, Scarlett?”

The economics of e-sports remain minor-league for all but a few lucky individuals. Players sign contracts with teams, which pay barista-like wages, in the sense that they are meant to be supplemented by tips for performance, or, in this case, by cash prizes. The odds of winning major tournaments are long, and many players also busk, by streaming their practice matches on Twitch and providing live commentary over their Webcams. Fans not only turn up in large enough numbers to generate advertising revenue (which Twitch shares with the talent) but sometimes donate cash. It’s an athletic—digitally athletic, anyway—Kickstarter campaign. The appeal is partly educational, a chance for mortal

talents to learn the tricks of the trade (or for rival professionals to scout tendencies and tactics). It’s also interactive, offering an opportunity, via the chat window, for fans to communicate directly with their heroes. A few weeks ago, three hundred and twenty thousand people tuned in to watch a live stream of the Chinese Dota 2 star Zhang (Xiao8) Ning’s wedding.

Twitch streams also attract aspiring casters, envious of Day9’s celebrity. Like young Tim McCarvers showing up at the neighborhood ball field with a mic and an amp, they befriend some players, suggest a scrimmage, and send word that they’ll be narrating the action.

Streaming naturally encourages exhibitionism, whether in the form of comic hostility, coquettish vulnerability, or outright titillation. Professional gaming is about as sedentary and inexpressive as live entertainment gets, and yet here is an opportunity to flash some personality—or more. Before Scarlett, the female gamers most young men were likely to have encountered online were not necessarily the best players but the showiest ones. *Gamer Girls* is a magazine that has more in common with *Playboy* than with *Sports Illustrated*. The stereotype was patently unfair to women who took gaming seriously. (One early poster to Scarlett’s online fan club appreciated the fact that “she made all those well advertised gamer girls look dumb.”) Three weeks ago, Amazon, in its new role of Twitch parent, banned shirtless and other “sexually suggestive” streams. That goes for men, too,

like Arteezy, a Dota 2 player for the formidable Evil Geniuses team, who had made a profitable habit of torso exposure; his Twitch channel has been viewed more than fourteen million times.

Scarlett once streamed to an audience of thirteen thousand from Cologne, but the practice generally holds little appeal for her. “Broadcasting to thousands and thousands of people what you’re doing at home—that can be kind of difficult,” she told me. When she’s at home, in Kingston, it’s a moot point. In her part of town, the Internet isn’t fast enough to stream from. Her father looked into getting a commercial line installed, but found that it might cost a hundred thousand dollars. Many teams encourage, or even require, streaming, as a means of publicity, but Scarlett’s success has so far enabled her to avoid such pressure.

Salaries are not public, but a player of Scarlett’s skill and visibility might expect to earn two or three thousand dollars a month. In the two and a half years since she began, she has also won a hundred and eleven thousand dollars in tournaments, and thousands more while playing in a team league. Her tournament winnings put her ten thousand dollars shy of Mystik (Kat Gunn), the competitive gamer at the top of *esportsearnings.com*’s all-time female standings, but that’s a little misleading, because a hundred thousand of Gunn’s earnings came from winning a Syfy channel reality-show competition. (Not that there’s anything wrong with that.) The next-closest woman StarCraft II player, Aphrodite (Kim Ga Young), has won fifty-seven hundred dollars.

It’s a living. A good one, in fact—especially for a twenty-year-old. Scarlett, in her first year as a pro, made more than her father did at his job. “I’ve never had to pay for my own plane ticket,” she said.

E-sports partisans like to point out that the rules of football are baffling, too, if you don’t grow up with them, and I sometimes wondered, as I mirrored Twitch streams on our family TV screen, whether my struggles to make sense of creep spread and proxy reapers were all that different from the experience of my wife, who was brought up in a sports-free household, sitting through the Jets vs. the Steelers. Our two-year-old son has been running around the house for weeks chanting “Scar-lett! Scar-lett!” in



“They’re all Neanderthals.”

imitation of the crowd at a tournament in Toronto that we once watched. Scarlett is, in a sense, his first introduction to fandom. He doesn't think it's unusual.

The notion, put forth at conferences and panels devoted to this sort of thing, that it is only a matter of time before e-sports surpass football is based on the idea that the term "gamer" itself is fast becoming meaningless, now that more people play games than go to movies. In another generation, the argument goes, this won't be a subculture; it'll be the culture (however balkanized). Yet, at the very moment when casual gamers might be venturing onto Twitch, the most mainstream e-sports platform, the founding denizens seem to be waving "Do Not Enter" flags, by flooding the chat window with rivers of insider memes and aggression. Consider the following exchange, which occurred around the time my son became a Scarlett fan, and also within seconds of someone with the username Protossed writing, "Let's all give a warm Twitch chat welcome to Jeff Bezos":

RIP DAY9
Xboct confirmed hot grill
Hope MCs anus is stretched enough
cause hes gonna get raped
In LoL you play LEGENDS. Sc2 you play
insects an shit hahaha
That make them shut up if you say who
she fucked she never seen me so
Oh, plz day nine is not dead again is he?

"Grill," btw, is code-speak for girl—a reference, presumably, to Scarlett. (I've omitted a more derogatory remark.) The MC referred to is another StarCraft pro who was playing in the same tournament. Several of these items were accompanied by images of faces, each of which has a different meaning to devotees. The most common such face, known as kappa, belongs to a former employee of the site that became Twitch. It's a smug mug, goes the idea, and you post it to indicate sarcasm or trolling. One kappa begets another, and pretty soon we're in meta-trolling territory, where the discussion seems to be acknowledging its own stupidity. "It may not seem like it, but there are a lot of mature viewers watching this right now, they just don't have anything retarded to say about scarlett," someone else wrote.

This is not the digital equivalent of sports-talk radio. These guys are hardly talking about the game; they're expressing sentiments about what it's like to be one

of the people who knew how to talk about the game before everyone else showed up. "It's a subculture within a subculture," the games journalist Rob Zacny told me, and he advised me to look away, likening the "creepy hive mind" at work to the GamerGate phenomenon, in the sense that it seemed to be driven by conflicted feelings about accommodating outsiders. What most subcultures want, after all, is to expand their influence while retaining their identity. You can't have both.

The mainstreaming of e-sports presents additional challenges particular to StarCraft. Bigger money has lately been fleeing to the multiplayer online battle arenas (MOBAs), like Dota 2 and League of Legends (LoL), where there is greater international parity (although the field is still tilted heavily in Asia's favor), and where the casual player base is broader and ever growing. The MOBAs borrowed some essential characteristics of StarCraft, like the bird's-eye perspective, but they are free to play (whereas StarCraft costs twenty dollars), and, more important, they are not nearly as difficult for beginners to pick up. Amid all this growth, StarCraft has become a connoisseur's taste rather than a mass spectacle. The Red Bull event in Washington was taking place at the Lincoln Theatre, with a capacity of slightly more than a thousand, while the League of Legends world championship would soon be played at the World Cup stadium in Seoul.

"For the future of StarCraft, Scarlett has to win," a journalist named Rod (Slasher) Breslau, whom I like to think of as the Bill Simmons of e-sports, told me, shortly before the tournament began. ("Fuck Slasher" is a meme on Twitch chat, incidentally, and Breslau told me, with surprising equanimity, that a day hasn't gone by in the past three years when he hasn't encountered that message anew.) Viewing Scarlett as a savior is a decidedly Western perspective, but it had the ring of truth. Blizzard, in an attempt to make its world-championship series truly "global," set up Asian, European, and North American qualifying brackets. But Korean players, finding their own bracket overstuffed with talent, began establishing temporary residency in the United States, or in Germany, so that they could qualify more eas-

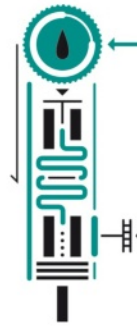
ily. "To allow the rest of the world to develop, we needed to make some changes," Mike Morhaime, the C.E.O. of Blizzard, told me recently, in defense of what amounts to an affirmative-action-for-white-people plan, called "region locking." Beginning next year, contestants will have to declare a continent of residency and stick to it.

Blizzard, according to the conventional wisdom, has made so much money from another game it sells, *World of Warcraft*, that, as Scarlett's father joked, "it can afford to throw gold checks out of airplanes indefinitely," and Morhaime is thought to be committed to keeping StarCraft, the founding e-sport, alive as a passion project, if nothing else. But, like classical

music, say, it threatens to wither if no new talent enters the scene. South Korea has compulsory military service, and men in their twenties (like Bomber, who is twenty-six) can postpone it only for so long. Meanwhile, *League of Legends*, as the new glamour sport, was attracting more of Korea's most talented teens.

Inside the Lincoln Theatre, enormous painted portraits of the eight finalists hung high on the walls flanking the stage. They showed seven Asian men, most with glasses and Bieberish haircuts, and then Scarlett. On the stage were two computer terminals side by side, separated by an opaque divider. Before the matches, the players arrived at their stations carrying backpacks that held earbuds, keyboards, and mice. Given the speed of the game, familiarity with your keys' sensitivity (to double-typing, say) and distance from one another is crucial. The mouse, too: you don't want a fancy commercial brand, with built-in acceleration. If you're counting on muscle memory, only a rudimentary mouse will do.

In go the earbuds, and then, over those, an aircraft-grade set of headphones, pumping white noise, to drown out the commentary and the crowd, watching the game projected onto a screen. Still, there are occasional roaring eruptions, from deep in the balcony, that can't help being discerned by the players onstage. Late in the game, this is no big deal to a contestant. You've done your scouting, and have a pretty good sense of your opponent's





"Oh, yes, Paul—whisper sweet sponsored content in my ear."

"build," or strategy. Cheering accompanies bloodshed: what else is new? But what if the noise invades your headspace in the first few minutes? It takes an iron will not to become anxious that the audience knows something important that you don't. Players call this the mind game.

In addition to the casters, StarCraft tournaments make use of a kind of cinematographer, known as the observer, whose job it is to decide which regions of the larger map to zoom in on and pan over, for dramatic effect on the giant projector screen. The observer's vision, which is also the spectator's, requires no advance scouting. He sees all—even "cheese."

I got my first introduction to the concept of cheesing during the opening game of Scarlett's first match, against PartinG, the self-styled bad boy of an otherwise staid scene. ("He makes sweatpants look good," one young woman said at the meet and greet, while gathering courage to ask him to pose with her for a picture.) Scarlett had told me that she was nervous about this pairing. Not only had PartinG

won the world championship in 2012, and finished first last year at the Hammerstein Ballroom, but she had never taken a single game off him. As they sat at their keyboards, waiting to be introduced, he typed her a private message, using what little English he knew, asking if she'd seen his recent stream. (She hadn't, but she figured that it involved a fair amount of trash talk.) "If I beat you, please don't hate me," he added. Three minutes later, the crowd roared, as it saw Scarlett plant a hatchery—a pulsing, cloudy blue blob—down in the corner, next to PartinG's home base. This was cheese—an all-in sneak attack, in essence a cheesy play—and it worked. Roaches hatched before PartinG had time to prepare an adequate defense, and, with them, Scarlett began dismantling his economic production. Gg. Time elapsed: six minutes, twenty-nine seconds.

As with baseball's hidden-ball trick and football's fake punts, the unwritten etiquette of cheesing is complicated. Do it too often, and not only will its efficacy diminish but you'll be seen as

annoying—disrespectful, even, if your over-all skill is of a lower calibre. It's like the Picasso rule of painting: you have to know the basics before you can abandon them. But when cheese is deployed selectively, against the right opponent, it can be a lot of fun. Buoyed by the early success, Scarlett went on to win the second game, too, this one a drawn-out, forty-minute affair. Another standing ovation. Later, Day9 said, "I think she might be the most entertaining player to watch in the history of StarCraft II."

How much of Scarlett's reputation for thrilling play can be attributed to projection on the part of e-sports enthusiasts who want to see, in this mysteriously shy girl from Canada, a Jackie Robinson figure to redeem them? Does it make a difference? Mike Morhaime, the Blizzard C.E.O., reminded me of another highlight from the Scarlett reel, in which, for a single game, she played as Protoss instead of Zerg, confounding—and defeating—her opponent. A switch-hitter! "I don't think anyone else has ever done that in tournament play before," Morhaime said.

During breaks between matches at the Lincoln, the producers aired personalizing video interviews with the contestants, mostly using subtitles, and it was easy, for an American raised on Mike Tyson and Neon Deion, to see why Scarlett's differentiation seemed to matter. Here was Bomber: "Every single loss is a life lesson." And last year's world champion, sOs: "In my opinion, I don't have the strongest mind-set as a professional player." (He noted, "I think we're all equally handsome.") A relative newcomer named Trap: "When I was a rookie, I had the wrong mind-set toward losses. . . . I was overwhelmed with pessimism. I think that's what kept me from coming out of my shell." DongRaeGu: "I can utilize Red Bull Battle Grounds as potent fertilizer for a rich harvest next season." He added, "I can't stand being smacked around any longer." Scarlett (whose reticence, in this instance, was pretty much the norm): "Mostly, success for me would be about being happy." Only PartinG diverted from the humble messaging. "I am one of the gods," he said.

The fans, young and male, for the most part, clapped Thundersticks and waved

handwritten signs, many of them mash notes to Scarlett. I saw one appealingly awkward teen with chin-length red hair give an interview to a TV camera, in which he declared that he was rooting for Scarlett, “of course.” Asked why, he blushed at first, and then said, “Well, because she’s—she’s awesome!”

For a while, I found myself sitting next to a slick-haired, barrel-chested man in an untucked button-down, pressed jeans, and black loafers who was drinking beer at a football fan’s pace. I’d guess that he was in his thirties. “I equate it to poker,” he said. “Fifteen years ago, if you mentioned Texas Hold ’Em, you were considered a degenerate gambler.” He seemed to know his stuff. “Gg right there, bro,” he called out, during a game between two players named Polt and Cure, in which Cure had staked a sizable lead. “You don’t come back from a forty-supply deficit, T v. T.” (That’s Terran v. Terran. I knew that much.) My seat-mate got around in the course of the weekend, and someone later speculated that he was a promoter of “show matches,” a Don King figure who arranges grudge matches between prominent StarCraft players and then sells advertising against them.

In the third game of that Polt-Cure match, the crowd began chanting, “U.S.A.! U.S.A.!” in support of Polt, whose nickname is Captain America, because he is taking English classes at the University of Texas. Polt, who received his athlete visa from the State Department last year, will be grandfathered in as a North American under Blizzard’s new terms.

It was Captain America, incidentally, who eliminated our Canadian hero, in a hard-fought three-game series during which the “U.S.A.!” chants were in scant evidence. The future of StarCraft seemed to pass anticlimactically, with a hand-shake and a head nod. Scarlett unplugged her keyboard and her mouse, and was quickly gone.

On Day Two, I ventured backstage. A semifinal match was going on, so the players’ lounge was occupied by the five other Koreans, a translator, a player “manager,” and Scarlett, who sat in front of a computer, reading message boards, instead of watching the action on a TV screen, like the others. “No one else is speaking English, unless they’re speaking to me, pretty much,” she said. “It’s just kind of a little bit lonely when I’m back

here.” After nearly a year’s worth of living in Seoul, she speaks some Korean, but only enough to get by. “We can’t have, like, deep conversations,” she said.

We retreated to a black leather couch in the neighboring room, near a snack table, and she reclined halfway, hugging a small pillow against her midsection. She had spent the previous night, back at the hotel, re-watching all of her games, alone, to see what went wrong. “If it’s a really bad defeat, you just get crushed,” she said. “It’s really depressing. Like, you feel like this is what you do, and you feel like you’re not good at it, so why are you playing?” Her feeling here was different, however. “Game Three versus Polt, I had four bases, about to get a fifth base, and he was stuck on three bases, and he wasn’t getting any more economy,” she said. “Soon, he was going to run out of resources. So if I had just defended, or even counterattacked...” Instead, she engaged in an all-out battle, one that her instincts inclined her to think would turn out in her favor. But those instincts were outdated. “Every once in a while, Blizzard changes the game,” she explained.

Now we were talking about what’s called the meta game, an inevitable result of the StarCraft designers’ decision to create three distinct races (for variety’s sake) and nonetheless run a fair competition. They aim for equality, but a collective intelligence takes over, in the form of all the games being played worldwide on a daily basis, among all the race combinations. One elite Zerg player’s inventive approach to countering a Protoss maneuver at around the five-minute mark, say, quickly becomes a new tactical convention, and over time the established conventions reveal unanticipated strengths and weaknesses: imbalance. Every so often, the coders go back to work, attempting to make amends, and release “patches” for the software. Another reshuffling necessarily occurs. After a recent patch, a few months ago, Terran players seemed to have emerged with new muscles. (Pro tip: if you want to insult your Terran-playing friend, call him a “patch Terran,” implying that his recent success is artificial.) “Right now, my race is a little bit on the weak side against Terran,” Scarlett said. Lending credence to her theory: the top three finishers at the Lincoln Theatre were all Terran players. Bomber took the crown.

Scarlett also said that she had “executed” poorly at times, and I, thinking of Sean Platt’s concerto analogy, wondered if she had lost battles owing to clumsy fingering. “No, no, no,” she said, and suppressed a chuckle. “We’re at the point where we don’t, like, mis-click on the keyboard. That’s not an issue.” The execution mistakes were all in the timing, she explained. It was a matter of being out of step with the orchestra. “There’s this one unit that Terran has”—a widow mine—“that takes a long time to recharge between attacks, like forty seconds. But it does a massive amount of damage in a small area. So I’m trying to send my cheap units that move really fast out in front, to take those hits. I’m trying to split my other units into small groups first, so they don’t get wasted on his units with high hit-points and low damage. So I’m trying to control those all, to run past his strong units in the front, and I’m also trying to use my flying units—I have to make sure they don’t get clumped up too much, because he has another unit that does area damage to those.”

I’d been surprised to see her reading fan commentary. She long ago swore off looking at Twitch chat (“I just don’t think about it, because it’s not worth thinking about,” she said), but she indulges in Reddit, which has been described as “the scene’s gossipy cyber town square,” and she visits the forums at teamliquid.net, a kind of StarCraft clearing house, sometimes even onstage between games, to see how people are reacting to the show she’s putting on. “I think I’m the only player that does that,” she added. (Online, her focus is narrow, and does not extend to broader gaming subjects beyond e-sports. When, on a different occasion, I asked her about GamerGate, she answered, “I don’t follow any of that.”)

She even posts herself, helping to clarify the interpretation of play in events she isn’t participating in. “And sometimes I’ll go and complain about things to blow off steam,” she said. These complaints usually take the form of “balance whines,” or meta-game grumbling about the effects of software patches. Balance whines are a little like manager-umpire confrontations, in the sense that they’re largely cathartic, because what’s done is done, but they are also performed in the hope that the ump might think he owes you one.

As we continued speaking, it became

clear that she credited StarCraft with bringing out her inner extrovert. The teen years were difficult, and included bouts of depression and periods of time that, as she once put it, “I’d rather not remember.” At the start of her pro career, she was terrified at the prospect of standing on a stage, in front of thousands of people. It was a mediated public life, to be sure: in a booth, wearing headphones, enveloped in white noise, eyes transfixed on a screen. But everyone—face to face, at least—had been nothing but warm. “Nowadays, most of my friends are from StarCraft,” she said. “Having to go to all the events, meeting all the fans, talking to a bunch of people—it really opened me up, and it motivated me to become more social, to work on my life. Like, I started exercising now, versus not at all, a few years ago.” When she’s in Kingston, she and her father practice Niten Ichi-ryū, a school of Japanese swordsmanship, in the back garden.

I mentioned Slasher’s remark, that the future of StarCraft was riding on her performance. “Wow, so much pressure,” she said, flashing a coy smile. “That’s kind of daunting.” She didn’t look especially daunted, and, in any event, she felt that she had done well enough to keep hope alive. “The games were close, the games were exciting,” she said. “Because it’s a North American event, with the crowd here, I was just doing crazy things!” It occurred to me that she could retire now in peace, assured that she had transcended all the identity politics—going from the great female hope to the great white hope to, simply, the hope.

Before Scarlett, the most prominent foreigner was a left-handed Swede named Johan (Naniwa) Lucchesi, a brilliant but hotheaded player, who had a reputation for lashing out at fans and tournament organizers, and for showing emotion onstage, before and after matches. Some fans coined the term “Naniwalk” to describe his slightly goofy swagger. Korean players, Day9 told me, used to “view it as a badge of honor to eliminate Naniwa, because he was so disrespectful.”

Naniwa played Protoss, because, as he Skyped me, “I was sure that they were the

most creative race,” owing to an ability called “chrono boost,” which facilitates switching strategies mid-game. (By contrast, he believes that Terran is “the most perfect race for people who like to do the same thing.”) He fell in love with real-time strategy games at the age of ten, while playing Warcraft III, another Blizzard title. The complexity of R.T.S. games was such, he felt, that boredom was inconceivable. No two contests were alike, not even after years of playing. “Basically, it’s art,” he said, and mentioned that he finds players “graceful” when they execute basic strategies so cleanly that even knowing those strategies in advance won’t help you beat them.

Last December, Naniwa and Scarlett played head to head in a show match for fourteen bitcoins—virtual currency for a virtual sport. (Bitcoins, like StarCraft II, were trending higher then, and that purse, when it was announced, was worth more than fourteen thousand dollars, the highest amount in the sport’s history.) They played from their respective continents, online. Best of seven, with games alternating on the European and North American servers, to negate connectivity advantages. Naniwa won, four games to two.

Then, not long afterward, he quit the sport. He was at a tournament in Poland, and playing against the Korean Dong-RaeGu, when he grew annoyed that the crowd’s reactions seemed to be aiding his opponent. Blaming the soundproofing, he walked offstage, to thousands of boos. He never returned.

He was twenty-three, and had been playing StarCraft II as much as fourteen hours a day since the end of high school. “Every night, I dreamed about the game,” he told me. “Every time I ate, I thought about the game. When you do this for a few years without a break, it wears you down.” He also found living in Korea “extremely lonely,” he said. “I basically felt I couldn’t be at my best if I didn’t go to Korea. And I didn’t want to go to Korea.”

“StarCraft II is declining,” Naniwa added. “Let’s face it. It’s very hard to get into. You play one on one and you get owned probably twenty games in a row, until you learn stuff. Most people can’t handle that.” Earlier this month, he re-

turned to public life at BlizzCon, Blizzard’s annual convention and championship series, where he was beta-testing the company’s new team game Heroes of the Storm, an attempt to cash in on the MOBA fad.

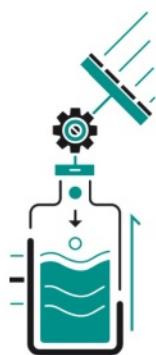
Scarlett told me that she can’t recall ever having dreamed about StarCraft. “It’s kind of a weird thing to be dreaming,” she said. She chose her race, Zerg, somewhat arbitrarily, based on “the look of how it played,” when she first started watching her brother (a Terran), and has come to appreciate the Zerg race for its “reactive” qualities. Figuring out what her opponent is doing, and then countering it, as in a puzzle, is what appeals most to her about the game.

Her habits, like those of many gamers, are sometimes nocturnal. She plays when she feels like it, and although she never drinks coffee (“It makes you shaky and less precise,” she told me), she can stay alert for long stretches, communicating with friends all over the world. Once, while crashing at the end of such a run, she slept for almost forty-eight hours, with only water and bathroom breaks interrupting her recovery.

Yet she rarely plays StarCraft more than three or four hours in a day, both because she suffers from painful tendinitis in her right wrist and because she finds the Korean tradition of relentless practice unnecessary, and even counterproductive: rote but without mindfulness. She learns almost as much from watching others’ games as from playing her own. Doctors have advised her that she’ll need to take six months off to give her wrist a chance to heal, and, at that point, she figures, she might as well retire and get on with her life. She is unlikely to follow the path of many e-sports pioneers as they age out, becoming casters or working on the production side of tournaments. Computer programming interests her as a possibility, and for that she assumes she will need to go back to school.

She is contemplating going to Seoul again next year. “I really enjoy living there,” she said. “It’s a very big change. It’s a big city with a subway. Also, it’s away from home. I like, at least half the time, not being here.”

Not long ago, she sat down at a desk in her bedroom, in Kingston, where she was breaking in a new, smaller keyboard that



would be easier to travel with. Kingston is at least two hours from any major airport; for a globe-trotting athlete, it really is the sticks. She was barefoot, dressed in skinny jeans and a T-shirt. The walls of her room were painted purple. Clothes were strewn about, along with science-fiction and fantasy novels. ("I like going into a different world and not thinking about life for a while," she once told me.) Her monitor sat on top of a cookbook, so that its height matched her eyes, which seldom wavered from the screen. She had turned the volume off. "I don't like the sound, anyway," she said. "I don't like anything bugging me when I'm playing."

It was a little after 4 P.M., and she had decided to engage in some "laddering," or seeking opponents online through Blizzard's algorithmic matching system. Instead of signing in to the North American server, she'd opted for Europe, where it would be nighttime and more people would be online, having already finished their dinner.

Rob appeared in the doorway, and said that he was planning to make fajitas. "Do we have cilantro?" she asked.

"Yeah, I got you cilantro."

"I use lots of cilantro when I make salsa," she said. "I don't like store-bought salsa."

She was logged in not as herself but as a "bar code," a sequence of vertical lines that she'd chosen as an alter ego, in order to practice anonymously. Many elite players use them: the first several players atop the ladder's rankings were all bar codes. "I won't play for more than an hour," she said.

The games began and ended without ceremony. Suddenly, she'd be typing rapidly, and her screen would be strobing as she flitted around the map, dispatching scouts and attending to her economic production. "I don't actually know how it looks to another person, because I'm used to the speed," she said. It was dizzying. "A lot of when I'm moving my screen around at the start of the game, it's not actually doing anything useful," she added. "It's just to get warmed up."

Her preference for playing in a vacuum, without distraction, was complicated by the presence of an intruder (me), and occasionally she let out a restrained "Ah!," indicating surprise at having forgotten to take care of something basic. At one point, playing a bar-



"Not you, too, Larry. Pumpkin-flavored?"

code Terran, she let out a string of four "Ah!"s, such that Rob responded from down the hall.

"You're losing?" he teased.

"No, it's O.K.," she said. "I think this is Bunny, actually. He's playing exactly like Bunny plays." Bunny, a Danish pro whose real name is Patrick Brix, is among the three best foreigners at the moment. "Two-base tank push," she continued, describing her opponent's strategy.

"You going muta-ling-bane, or what?"

Rob asked, now standing in the doorway. "Well, I guess he's not Bunny, because this guy's not very good," she said, as her opponent collapsed and bowed out. The algorithm delivered another Terran, a Ukrainian named Kas, and she began again.

"I'm going to start the salsa," Rob said. "Do you want me to drain the tomatoes or just put 'em in as is?"

"You can make the salsa," she said, without breaking concentration.

"You'll do the spice level," Rob said. "I'll do everything else." Scarlett's tolerance for spicy food exceeds that of anyone else in the family. At Indian restaurants, she asks politely, using Hindi phrases, for the spiciest off-menu items.

"This guy plays the most of anyone in the world," she said, turning her thoughts back to Kas. "At least a thousand games a month. He's known for that. He's one of the better Terran players in Europe. He's professional-ish."

She lost the first game, and began stretching her right wrist. Then she struggled again in a rematch. "Ah!"

"You're losing?"

"Yes! I'm losing to Kas!" She mentioned, more than once, that this was a problem she had with streaming, too. "Talking and not focussing," she said. "I've lost a tournament because I didn't see a dot for a few seconds. Like, I lost thousands of dollars because I didn't see a single red dot. It's a big deal."

Kas took the second, and they began a third. She typed "glhf," for "good luck, have fun," a bit of gaming-café etiquette.

"You need to come finish the salsa!" Rob yelled. The allotted hour had passed. The fajitas were done. "So finish this game." He paused a moment, and then asked, "Who are you playing now?"

It was Kas again. Game Four. She'd won the last one, and was back in a groove. "So, he just took a risk, and ran behind my mineral line," she said. "And if I cared I could've probably just killed it with my workers, but I didn't." She wasn't interested in winning quickly. Her troubles against Terran had been occurring in the middle to late ranges of games. She was determined to come up with a solution to the patch, and so she'd keep drawing Kas out, stalling if she had to.

"Come on!"

She was pushing ninety minutes, eyes on the screen. ♦



A REPORTER AT LARGE

THE UNBLINKING STARE

The drone war in Pakistan.

BY STEVE COLL

At the Pearl Continental Hotel, in Peshawar, a concrete tower enveloped by flowering gardens, the management has adopted security precautions that have become common in Pakistan's upscale hospitality industry: razor wire, vehicle barricades, and police crouching in bunkers, fingering machine guns. In June, on a hot weekday morning, Noor Behram arrived at the gate carrying a white plastic shopping bag full of photographs. He had a four-inch black beard and wore a blue shalwar kameez and a flat Chitrali hat. He met me in the lobby. We sat down, and Behram spilled his photos onto a table. Some of the prints were curled and faded. For the past seven years, he said, he has driven around North Waziristan on a small red Honda motorcycle, visiting the sites of American drone missile strikes as soon after an attack as possible.

Behram is a journalist from North Waziristan, in northwestern Pakistan, and also works as a private investigator. He has been documenting the drone attacks for the Foundation for Fundamental Rights, a Pakistani nonprofit that is seeking redress for civilian casualties. In the beginning, he said, he had no training and only a cheap camera. I picked up a photo that showed Behram outdoors, in a mountainous area, holding up a shredded piece of women's underwear. He said it was taken during his first investigation, in June, 2007, after an aerial attack on a training camp. American and Pakistani newspapers reported at the time that drone missiles had killed Al Qaeda-linked militants. There were women nearby as well. Although he was unable to photograph the victims' bodies, he said, "I found charred, torn women's clothing—that was the evidence."

Since then, he went on, he has photographed about a hundred other sites in North Waziristan, creating a partial

record of the dead, the wounded, and their detritus. Many of the faces before us were young. Behram said he learned from conversations with editors and other journalists that if a drone missile killed an innocent adult male civilian, such as a vegetable vender or a fruit seller, the victim's long hair and beard would be enough to stereotype him as a militant. So he decided to focus on children.

Many of the prints had dates scrawled on the back. I looked at one from September 10, 2010. It showed a bandaged boy weeping; he appeared to be about seven years old. There was a photo of a girl with a badly broken arm, and one of another boy, also in tears, apparently sitting in a hospital. A print from August 23, 2010, showed a dead boy of perhaps ten, the son of an Afghan refugee named Bismillah Khan, who lived near a compound associated with the Taliban fighting group known as the Haqqani network. The boy's skull had been bashed in.

Armed drones are slow-moving pilotless aircraft equipped with cameras, listening devices, and air-to-ground missiles. They can hover over their targets for hours, transmitting video feed of the scene below, and then strike suddenly. They can be flown by remote control from great distances. The models used by the C.I.A.—the Predator and the Reaper—look like giant robotic flying bugs, with unusual flaps and pole-like protrusions. Pilots steer them and fire missiles while sitting before video monitors; during a C.I.A. mission over Pakistan, a pilot might be at a base in Jalalabad, Afghanistan, or as far away as Nevada.

Last year, in a speech at the National Defense University, President Obama acknowledged that American drones had killed civilians. He called these incidents "heartbreaking trage-

dies," which would haunt him and those in his chain of command for "as long as we live." But he went on to defend drones as the most discriminating aerial bombers available in modern warfare—preferable to piloted aircraft or cruise missiles. Jets and missiles cannot linger to identify and avoid non-combatants before striking, and, the President said, they are likely to cause "more civilian casualties and more local outrage."

The President's commitment to what his Administration calls "surgical strikes" against terrorists and guerrillas has come to define his approach to war and counterterrorism. The decision to enter into a conflict with the Islamic State in Iraq and al-Sham, or ISIS, in which a precision air war, including the use of drones, figures heavily, is the latest, and perhaps the riskiest, manifestation of a growing reliance on targeted air strikes to manage terrorist threats. The strategy against ISIS is derived from the President's experience commanding the C.I.A.'s drone war in Pakistan, and from similar but less active drone campaigns in Yemen and Somalia.

The conflict with ISIS once again pits the world's most technologically advanced military against a stateless guerrilla group. In such a contest, civilian casualties are not only a moral issue; they constitute a front in a social-media contest over justice and credibility. This summer, when the Administration opened its air assault in northern Iraq, ISIS media specialists tweeted photos of children who reportedly had been killed and wounded earlier by American drones in Yemen.

Obama's advocacy of drones has widespread support in Washington's foreign-policy and defense establishments. As Secretary of State, Hillary Clinton wholeheartedly backed the drone campaigns in Pakistan and Yemen. Republican hawks like John McCain and



Prelude to violence: In North Waziristan, people looked up to watch as drones circled for hours, or even days, before striking.

ILLUSTRATION BY PATRIK SVENSSON

THE NEW YORKER, NOVEMBER 24, 2014 99

Lindsey Graham, who otherwise criticize the President as effete and indecisive, are also enthusiastic. But do drones actually represent a humanitarian advance in air combat? Or do they create a false impression of exactitude? And do they really serve the best interests of the United States?

Pakistan has absorbed more drone strikes—some four hundred—than any other country, and has been a test bed for the Administration’s hypotheses about the future of American air power. Between mid-2008 and mid-2013, C.I.A.-operated drones waged what amounted to an undeclared, remotely controlled air war over North and South Waziristan, a sparse borderland populated almost entirely by ethnic Pashtuns. As the campaign evolved, it developed a dual purpose: to weaken Al Qaeda, and to suppress Taliban fighters who sought to cross into Afghanistan to attack American troops after Obama ordered a “surge” of forces there, in December, 2009. (Drone strikes continue in Pakistan; seventeen have been reported so far this year.) The drone war in Pakistan took place during an increasingly toxic, mutually resentful period in the long, unhappy chronicle of relations between the United States and Pakistan. To many Pakistanis, including Army officers and intelligence officials in the Inter-Services Intelligence Directorate, or I.S.I., drone strikes have symbolized American arrogance. Within the C.I.A. and the White House, a belief took hold that Pakistani generals and intelligence chiefs were unreliable partners in the fight against Al Qaeda and the Taliban. Administration officials concluded that since Pakistan wouldn’t help adequately to protect U.S. soldiers and American cities, they would send drones to do the job.

President Obama and C.I.A. officials characterize the drone campaign as a major success, because it significantly reduced the ability of “core Al Qaeda”—the organization founded by Osama bin Laden—to carry out terrorism on American soil and against American and British aviation. Moreover, Obama’s advisers

argue, the drone war achieved this while inflicting few civilian casualties. And, they say, the machines helped the United States avoid conventional bombing or ground raids in Pakistan, which would have put American troops at risk and created even greater chaos and anger in an unstable country that possesses more than a hundred nuclear weapons.

In a 2012 report that was based on nine months of data analysis and field interviews, a team of law students from New York University and Stanford concluded that the dominant narrative in the U.S. about the use of drones in Pakistan—“a surgically precise and effective tool that makes the United States safer by enabling ‘targeted killing’ of terrorists, with minimal downsides or collateral impacts”—is false. The re-

searchers found that C.I.A.-operated drones were nowhere near as discriminating toward noncombatants as the agency’s leaders have claimed. Various estimates have put the civilian death toll in the hundreds. An analysis of media reports by the New America Foundation concluded that drones probably killed some two hundred and fifty to three hundred civilians in the decade leading up to 2014. Researchers working under Chris Woods at the London-based Bureau of Investigative Journalism conducted field interviews to supplement a separate analysis of media reporting. They estimated that American drones killed between four hundred and nine hundred and fifty civilians.

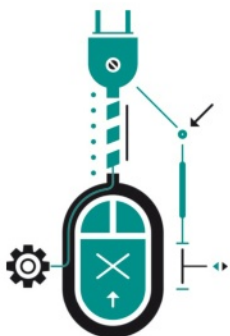
The C.I.A.’s position is that these nongovernmental counts are much too high and have been influenced, if inadvertently, by Pakistani government and Taliban propaganda. Early last year, the White House reviewed an internal classified count compiled by the C.I.A. of civilian deaths from drone strikes. Senator Dianne Feinstein, who chairs the Select Committee on Intelligence, disclosed the count’s existence at a congressional hearing. She said that classified documents showed that civilian deaths caused by C.I.A. drones each year were “typically in the single digits.” The review remains unpublished—in part, a for-

mer Administration official said, because the White House couldn’t resolve internal debates about the reliability of its methodology. There was also reluctance to publish a specific number, since it would only invite more questions and might expose the scope of classified drone operations. (A C.I.A. spokesman declined to comment for this article.)

The proportion of civilians compared to combatants killed on the ground during American wars since Vietnam has been disputed by researchers. But even the most conservative estimates of civilian casualties place the ratio at one-to-one. In the 1999 NATO-led war in Serbia, where jets used laser-guided and other precision bombs, around five hundred Serbian civilians and three hundred Serbian soldiers were killed, according to the Independent International Commission on Kosovo. The total death toll from drone strikes in Pakistan is estimated at between two thousand and four thousand. Even if one accepts a civilian death toll of nine hundred and fifty-seven—the highest nongovernmental estimate—drones have probably spared more civilians than American jets have in past air wars. And if the numbers Feinstein cited are accurate, drones killed more than twenty fighters for every civilian—a huge leap in precision. Nevertheless, even by that estimate hundreds of families in North and South Waziristan would have suffered the death of an innocent—hardly the foundation for an imagined new age of less provocative American bombing.

There are many reasons to be skeptical of the C.I.A.’s unpublished, lower estimate. According to former Obama Administration officials, the C.I.A.’s Counterterrorism Center, which oversees the agency’s drone operations, generates an after-action report, which includes an assessment of whether there was collateral damage. The center has a specialized, independent group that conducts post-strike investigations. The investigators grade the performances of their colleagues and bosses—not exactly a recipe for objectivity. But it seems clear that, over time, the Administration’s record improved significantly in avoiding civilian casualties.

In 2008, the last year of the Bush



Administration, at least one child was reported killed in a third of all C.I.A. drone strikes in Pakistan, according to the Bureau of Investigative Journalism—a shocking percentage, if it is accurate. In Obama's first year in office, the figure was twenty per cent—still very high. By 2012, it was five per cent.

Former participants in drone operations attribute the improvement in part to a second-generation armed drone, the Reaper, which allowed operators to scrutinize targets for longer periods on a single flight. Earlier drones carried five-foot-long Hellfire missiles, originally designed to destroy battle tanks; over time, the accuracy of Hellfires improved. The Reaper can also fire a missile, known as the Small Smart Weapon, that is less than two feet long and can take out an individual without killing people in the next room. Strike statistics suggest that, as the C.I.A. improved its procedures for sparing non-combatants, operators fired less often at private homes in North Waziristan, where women and children might also be present. After September, 2010, drones attacked suspected militants riding in vehicles more often than before. "There have been multiple improvements to tailor warheads' blast radiuses to meet particular target characteristics," David Deptula, who served as a deputy chief of staff for intelligence in the Air Force's drone program until 2010, said.

Exactly why and how this change may have been ordered, like much else about the evolution of drone warfare, remains an official secret. The Obama Administration has shielded from public examination essential facts about how often targeting failed and innocents died, and why. In the Bush Administration and the Obama Administration alike, secrecy has defeated public candor and accountability.

Shortly after American Airlines Flight 77 struck the Pentagon, on September 11, 2001, computers at the C.I.A. flashed an instruction: "Immediate Evacuation." From the seventh floor of the Old Headquarters Building, John Rizzo, the agency's highest-ranking career lawyer, watched traffic jams form at the exits from the agency's campus. He decided to stay put, as he recounted in a

recent memoir. It was clear that the country had suffered an unprecedented terrorist attack, almost certainly by Al Qaeda, which the C.I.A. had been pursuing for several years. Rizzo took out a yellow legal pad and scribbled notes for what he assumed the agency would now require: a new Memorandum of Notification, or M.O.N., a bed-rock document of any C.I.A. covert-action program.

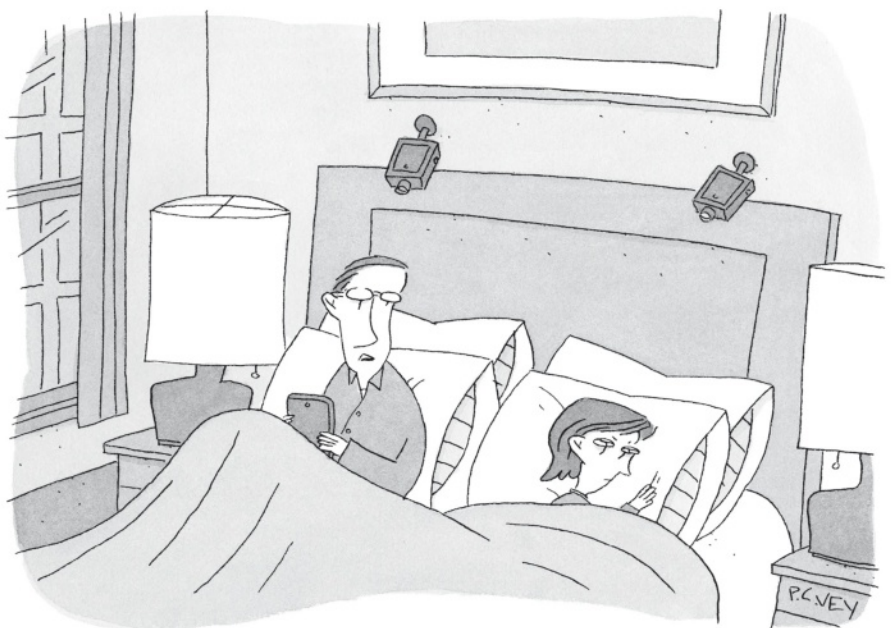
A C.I.A. covert action seeks to surreptitiously influence events abroad while allowing the United States to deny the project's existence. The National Security Act of 1947 legalized covert action as long as a President finds that it does not violate the Constitution or U.S. law and is required to protect the nation. A President must sign a written "Finding" that authorizes the program. Memorandums of Notification are highly classified follow-on documents—specific orders from a President to the C.I.A. describing the scope and the necessity of the operation. They can be concise, sometimes as short as a single page.

On September 17, 2001, President George W. Bush signed a new counterterrorism M.O.N., partly based on Rizzo's input. It was "multiple pages" in length, according to Rizzo. He had worked at the C.I.A. since 1976 and he regarded this document as the "most

comprehensive, most ambitious, most aggressive, and most risky Finding or M.O.N. I was ever involved in." Among its provisions, "one short paragraph" authorized targeted killings of Al Qaeda terrorists and their allies. "The language was simple and stark." That paragraph became the foundation for the C.I.A.'s drone operations.

George Tenet, the agency's director at the time, supplemented the M.O.N. with internal guidelines that set down in greater detail how an individual believed to be actively involved in terrorist plots could be nominated and approved for capture or killing. Among other things, the guidelines instructed drone supervisors to avoid civilian casualties "to the maximum extent possible," according to a former senior intelligence official. It was a decidedly lawyerly and elastic standard.

Pakistan's President, Pervez Musharraf, an Army general who had seized power in a 1999 coup, became a trusted partner as the Bush Administration's Global War on Terror unfolded. When American-led forces invaded Afghanistan, in the fall of 2001, many Al Qaeda leaders and foot soldiers—Arabs, Uzbeks, Chechens—escaped into Pakistan. They settled mainly in a region known as FATA, for Federally Administered Tribal Areas, which includes North and South Waziristan and has



"If you're not planning to break the law, why should you care?"



"I could be a saint if I really wanted to."

been a staging ground for jihadist warfare since the nineteen-seventies. Pakistan's generals and politicians, who come mainly from the country's dominant, more developed province of Punjab, treated Waziristan's residents "as if they were tribes that were living in the Amazon," the journalist Abubakar Siddique, who grew up in the region and is the author of "The Pashtun Question," told me.

In 2002, Musharraf sent Pakistan's Army into South Waziristan to quell Al Qaeda and local sympathizers. In 2004, the Army intensified its operations, and, as violence spread, Musharraf allowed the C.I.A. to fly drones to support Pakistani military action. In exchange, Musharraf told me, the Bush Administration "supplied us helicopters with precision weapons and night-operating capability." He added, "The problem was intelligence collection and targeting. . . . The Americans brought the drones to bear."

Musharraf allowed the C.I.A. to operate drones out of a Pakistani base in Baluchistan. He told me that he often urged Bush Administration officials, "Give the drones to Pakistan." That was

not possible, he was told, "because of high-technology transfer restrictions."

On June 17, 2004, a C.I.A. drone killed Nek Muhammad, a Pakistani jihadi leader in Wana, in South Waziristan, who had cooperated with Al Qaeda and led attacks against the Pakistani military. That strike and three subsequent ones in North Waziristan during 2005 were carried out with prior approval from I.S.I., a senior C.I.A. official who served in the region told me. "I would show them the Predator footage and I would say, 'This is what is happening—massive training camps.'" He added, "Every one of these shots was with Pakistani approval."

For several years, the Bush Administration used drone strikes sparingly. At the C.I.A., according to Brian Glyn Williams, a historian at the University of Massachusetts at Dartmouth (his book "Predators: The C.I.A.'s Drone War on Al Qaeda" was published last year), some career officers were reluctant to use drones, because they had "seen the agency burned in the past." Some also feared that too many strikes

would destabilize Pakistan and jeopardize Musharraf's position.

In 2006, Bush chose Michael Hayden, a former Air Force general, to be the agency's director. The Counterterrorism Center also got a new leader. His cover name, which has been reported elsewhere, is Roger. Former colleagues describe him as an acerbic, chain-smoking convert to Islam. At a time when Al Qaeda showed signs of revived potency, he argued that drone strikes could weaken its leadership and prevent terrorist attacks on the United States.

That year, an Uzbek militant who had been arrested and detained in Afghanistan told his American interrogators that they should check out the bottom of the wheeled duffel he had been toting when he was taken in. They pulled the bag out of storage and found, according to a senior government official involved in the case, "an eight-and-a-half-by-eleven sheet of paper, folded up," in a hole next to the wheel. It contained Al Qaeda's "code system," the official said—that is, code words used in radio and cell-phone communications to discuss meeting arrangements and plans for violent operations.

The paper also mapped militants' facilities in the vicinity of Miranshah, one of North Waziristan's main towns, the official recalled. The breakthrough led to an ambitious mapping and analysis effort involving satellite photography of Miranshah residences. The National Security Agency searched for the code words in archived transcripts of intercepted phone calls, in order to discover undetected plots and to pinpoint the locations of Al Qaeda leaders. Soon, this effort was also supporting American drone strikes in North Waziristan.

In July, 2008, President Bush approved a plan, proposed by Hayden, to increase drone strikes on Pakistani soil, mainly in North and South Waziristan. Taliban fighters were pouring into Afghanistan from FATA, without much interference from Pakistan, to attack American troops. "These sons of bitches are killing Americans. I've had enough," Bush told Hayden, according to Bob Woodward's "Obama's Wars" (2010). No longer would the United States seek permission from Pakistan to strike or

notify Pakistani generals in advance. (Musharraf, who had been coddled and protected by Bush for years, was facing impeachment and resigned a month later.)

Hayden approved changes to the internal C.I.A. targeting and strike guidelines. These changes gave rise to what would become known as “signature strikes.” The new rules allowed drone operators to fire at armed military-aged males engaged in or associated with suspicious activity even if their identities were unknown. (To justify this looser approach, a former Administration official said, C.I.A. lawyers relied on instructions in an M.O.N. that permitted strikes on terrorist property and facilities.)

Signature strikes are “not a concept known to international humanitarian law,” according to Christof Heyns, the U.N. special rapporteur on extrajudicial, summary, or arbitrary executions. The proper standard for attacking a person under the laws of war is whether the person has a “continuous combat function” or is “directly participating in hostilities.” If a signature strike rests on “targeting without sufficient information to make the necessary determination, it is clearly unlawful,” Heyns argues in a 2013 report submitted to the U.N. General Assembly. The Obama Administration’s position is that, relying on intelligence sources, the C.I.A.’s remote operators could determine whether armed men were involved in violence directed against American personnel and interests. Under the laws of war, which the Administration asserted were applicable in FATA, it isn’t necessary to know the names of enemy guerrillas before attacking.

After mid-2008, the drone program changed quickly into a more conventional, if unacknowledged, air war. In the three months between August and October, drones struck North and South Waziristan at least twenty times—more strikes than in the previous four years. The C.I.A.’s operators repeatedly hit Al Qaeda or Taliban targets when women and children were present. On September 8, 2008, missiles demolished a North Waziristan home belonging to Jalaluddin Haqqani, the defiantly anti-American leader of the Haqqani network. He was absent, but Al Qaeda’s

chief in Pakistan, Abu Haris, was reportedly killed. Eight women and five children also died, according to a ledger of drone strikes maintained by the FATA government. The ledger records ten other cases of civilian casualties between September and December of 2008. According to the Bureau of Investigative Journalism, children were killed in seven of these instances. When I asked Hayden about those statistics, he replied, “The C.I.A. never had to be reminded of the value of human life. I’m a G.I. and I know the laws of armed conflict: Necessity, distinction, and proportionality are the three rules.” Hayden declined to comment specifically about the C.I.A.’s counterterrorism program in Pakistan, but he added that unmanned aerial vehicles provide “an unblinking stare at a target and the opportunity to be incredibly precise.”

In November, Hayden briefed President-elect Obama. According to Gregory Craig, who subsequently joined the new Administration as White House counsel, “Hayden had obviously spent a lot of time, energy, and intellectual resources preparing to explain the drone program—to reassure us about why it was such a successful counterterrorism tool.” Hayden’s presentation was effective, Craig said. “I walked out of there convinced.”

On January 23, 2009, three days after Obama took office, two C.I.A. drones struck inside Pakistan—one in South Waziristan and one in North Waziristan. Both attacks reportedly killed civilians. The strike in North Waziristan hit a private home in the village of Zeraki. According to an affidavit from two witnesses, filed in a complaint to the United Nations Human Rights Council, the dead included an eighth-grade boy and schoolteachers. The South Waziristan strike killed a pro-government peace negotiator who was a tribal leader and four of his family members, entirely in error, according to “Kill or Capture” (2012), a book about Obama’s counterterrorism policy by the former *Newsweek* reporter Daniel Klaidman.

According to Klaidman, John Brennan, at the time Obama’s counterterrorism adviser, briefed the President about the South Waziristan mistake and

Obama asked how it could have happened, given the weapons’ supposed pinpoint accuracy. The President delivered sharp words to C.I.A. officials about the targeting error. Yet he ordered no changes in drone targeting rules at the time, Klaidman reported.

Brennan was a career C.I.A. analyst and a former station chief in Riyadh. He had advised Obama during the 2008 Presidential campaign. Invited to join the Administration, he supported and managed his former agency’s advocacy of the targeted killing of suspected terrorists. Brennan also had the experience and the gravitas to push back at the C.I.A. Obama grew to trust him deeply on counterterrorism policy, according to former Administration officials.

To succeed Hayden as the agency’s director, Obama selected Leon Panetta, a former chairman of the House Budget Committee, who was known for his bluntness. During the Clinton Administration, he had headed the Office of Management and Budget and served as White House chief of staff. He had barely any intelligence experience. New C.I.A. directors, especially those who are outsiders, are typically advised not to alienate career C.I.A. officers serving on the front lines. Unlike F.B.I. directors, who are appointed to ten-year terms, C.I.A. directors come and go; the agency’s bureaucracy has learned to outlast them. Counterterrorism Center leaders saw the drone campaign as their most important operation, and Panetta backed them fully. As he familiarized himself with the C.I.A., Panetta judged the Counterterrorism Center to be “very effective, well run, well resourced, well managed,” a former Administration official told me. In 2009, Panetta oversaw some fifty lethal drone attacks; more than half of them produced civilian deaths, according to the Bureau of Investigative Journalism. “American policy was to avoid civilian casualties wherever possible,” Panetta wrote in his recently published memoir. An operation that deliberately targeted women or children alongside terrorist suspects “was to be authorized only under extraordinary circumstances.” Panetta described cases in which he gave such permission, while seeking to

"balance duty to country and respect for life."

In December, 2009, a Jordanian doctor whom the C.I.A. had recruited as an agent inside Al Qaeda blew himself up at an American base in Khost, Afghanistan, killing six agency officers and a contractor. He had really been working for the Pakistani Taliban. The attack was "a big emotional moment for Panetta," the former Administration official said. The following year, the number of drone strikes inside Pakistan doubled. "The C.I.A. really went to war," a participant in White House discussions about the attacks recalled, and Brennan and Obama were supportive. "The White House stood back."

At dusk in Islamabad one evening early this summer, I drove to Fatima Jinnah Park, a vast expanse of footpaths, fields, and eucalyptus trees. It was filled with strolling couples and families on picnics. An acquaintance had arranged a meeting with half a dozen young men from North Waziristan, most of them university students, who had lived through parts of the American drone war in their home villages and towns. In a coffee shop, we sat on plastic chairs in a semicircle and ordered soft drinks. The young men wore polo shirts and bluejeans. Most of them came from relatively privileged tribal families that had suffered during the Taliban's rise to power in Waziristan. The students asked me not to identify them.

Some had come of age as Taliban volunteers. One said that, after 2001, when he was ten or eleven, he carried plastic buckets from house to house to collect money for the organization. Taliban warriors were seen as heroes. "Our parents went to the jihad during the nineteen-eighties," a student said. He meant the C.I.A.-backed campaign against the Soviet occupation of Afghanistan. "Eight or ten years ago, we were all in favor of the Taliban."

That changed. One young man described how the Taliban had kidnapped his father for ransom. Others talked of arbitrary rules and detentions once the Taliban asserted power, after 2007, when they were teen-agers. "We are between two extremes," another student said.

"We face regular forces and we also face irregular forces with long hair, beards, and their codes of conduct. It was very difficult to resist them. They imposed their own brand of Islam. If you did not cooperate, you were kidnapped, you were beheaded."

The Taliban are "terrorists," he continued. But he considered the United States a greater menace, because, as the world's leading military power, it "controlled all of this, or could have." But America pursued its own objectives, he said, mainly with drone strikes. "Our economy has been destroyed, our social structure has been destroyed."

"The drones create a lot of misery in our area," one student said. "So do the Arabs." He meant Al Qaeda. "Why are the Arabs coming to our country? Why are they not fighting in their own countries? But we also say to America: If you say the Taliban are terrorists, yes, we agree. They are. But who created them?"

As night fell and we talked on, some of the young men acknowledged that the drone strikes they had seen or heard about from family members have been highly accurate. A few thought that drones offered a better way to bomb Taliban and Al Qaeda leaders in their home towns than F-16s flown by Pakistani pilots, whose bombing could be much more erratic, placing more local civilians at risk. But they also talked about the suffering their families had endured—kidnappings, homes abandoned under pressure—and their own struggles to obtain an education. In their telling, the relative precision of the aircraft that assailed them wasn't the point.

Being attacked by a drone is not the same as being bombed by a jet. With drones, there is typically a much longer prelude to violence. Above North Waziristan, drones circled for hours, or even days, before striking. People below looked up to watch the machines, hovering at about twenty thousand feet, capable of unleashing fire at any moment, like dragon's breath. "Drones may kill relatively few, but they terrify many more," Malik Jalal, a tribal leader in North Waziristan, told me. "They turned the people into psychiatric patients. The

F-16s might be less accurate, but they come and go."

Predator and Reaper drones emit what, on the ground, sounds like a flat, gnawing buzz. (Locals sometimes refer to a drone as a *bangana*, a Pashto word for "wasp.") "In the night, we have seen many times the missile streaking," Ihsan Dawar, a Pakistani reporter from North Waziristan, told me. "It creates a *whoosh*-like sound coming out."

The targeted killing of Taliban and Al Qaeda members had a boomerang effect: it spurred the militants to try to identify spies who might have betrayed them. Around North Waziristan's main towns, Miranshah and Mir Ali, which took the brunt of the strikes, paranoia spread.

The Taliban blamed local maliks, government-subsidized tribal leaders who had long presided over the area's war economy—smuggling, arms dealing, mining, and government contracting—often by engaging in corruption. Taliban gunmen seeking control of local rackets executed maliks and their family members in the hundreds. In local bazaars, the Taliban distributed DVDs of their socially superior victims confessing that they had spied for C.I.A. drone operators.

The confessions included elaborate narratives about how the agency supposedly distributed "chips," or homing beacons, to local spies. The spy would toss a chip over a neighbor's wall or into a Taliban jeep, to guide drone missiles to it. The men also confessed that the C.I.A. had given out special pens with invisible ink which were used to mark Taliban vehicles for destruction.

According to the accounts of former detainees, the Taliban tortured their prisoners, so the confessions can hardly be taken at face value. The Taliban also had a powerful motive to force the maliks to admit to spying: such confessions "take the edge off the revenge motivation of the malik's tribe and family," a researcher who grew up in North Waziristan and works in development in Islamabad told me. "People see the video and say, 'Oh, well, if he was a spy tossing around chips, then he deserves to die.'"

Homing beacons are common in policing and espionage. The C.I.A. no

doubt uses such devices. Yet it's far from clear whether actual C.I.A. spies in North Waziristan operated by planting chips. The cameras and the telephone-tracking equipment on drones would also allow the C.I.A. to identify and follow targets.

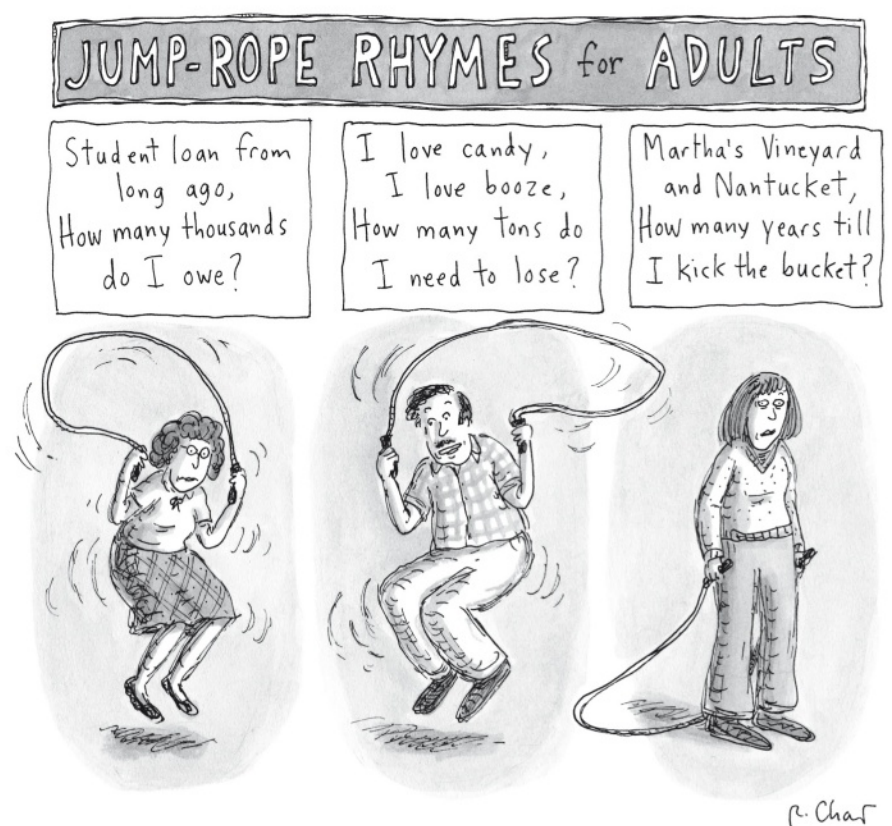
"As a journalist, I haven't seen any chip," Dawar told me. "I don't know if it has any reality behind it or is just a myth." Yet many people believe, he added, that a chip "throws off ultraviolet rays or some kind of magic ray and the missile comes and hits the target."

Not only do many civilians in Waziristan credit the existence of chips but many Taliban do, too. "Once, when I was home, we had a Taliban commander come to our guesthouse and ask to spend the night," the researcher in Islamabad recalled. "He slept in the guesthouse, but he made his driver and two guards sleep in the car and stand around it all night to prevent someone from using the magic pen."

Families in North Waziristan typically live within large walled compounds. Several brothers, their parents, and their extended families might share a single complex. Each compound may contain a *hujra*, or guesthouse, which usually stands just outside the main wall. In the evening, men gather there to eat dinner and talk war and politics. A rich man signals his status by building a large *hujra* with comfortable guest rooms for overnight visitors. The less well-heeled might have a *hujra* with just two rooms, carpets, rope cots, and cushions.

Taliban and Al Qaeda commanders moved from *hujra* to *hujra* to avoid detection. The available records of drone strikes make clear that the operators would regularly pick up commanders' movements, follow them to a *hujra* attached to a private home, watch for hours—or days—and then fire. Many documented strikes took place after midnight, when the target was presumably not moving, children were asleep, and visitors would have returned home.

North Waziristan residents and other Pakistanis I spoke with emphasized how difficult it would be for a drone operator to distinguish between circumstances where a Taliban or Al Qaeda commander had been welcomed into a



hujra and where the commander had bullied or forced his way in. If the Taliban "comes to my *hujra* and asks for shelter, you have no choice," Saleem Safi, a journalist who has travelled extensively in Waziristan, told me. "Now a potential drone target is living in a guest room or a guesthouse on your compound, one wall away from your own house and family."

"You can't protect your family from a strike on a *hujra*," another resident of North Waziristan said. "Your children will play nearby. They will even go inside to play." The researcher in Islamabad said, "There is always peer pressure, tribal pressure, to be hospitable." He went on, "If you say no, you look like a coward and you lose face. Anyway, you can't say no to them. If a drone strike does take place, you are a criminal in the courts of the Taliban," because you are suspected of espionage and betrayal. "You are also a criminal to the government, because you let the commander sleep in your *hujra*." In such a landscape, the binary categories recognized by international law—combatant or noncombatant—can seem inadequate to describe the culpa-

bility of those who died. Women, children, and the elderly feel pressure from all sides. A young man of military age holding a gun outside a *hujra* might be a motivated Taliban volunteer, a reluctant conscript, or a victim of violent coercion.

During 2009 and 2010, many of the deaths of children and other civilians recorded contemporaneously by the FATA government occurred during strikes on *hujras* and homes. Noor Behram's photography and that of other journalists occasionally brought the faces of injured or dead children to public attention, through the Pakistani press and Western human-rights groups. The photos offered a narrative of civilian suffering and became propaganda tools for Taliban media outlets. Targeting errors also became a front in an information war waged by I.S.I. against the United States.

For decades, I.S.I. officers have harbored deep ambivalence about their putative allies at the C.I.A. (According to Pew Research Center opinion polls, a majority of Pakistanis believe that the United States is an enemy of



"I'd never say this if Matt weren't in a text trance, but I'm having a fling with our FreshDirect guy."

their country.) Beginning in 2009, the Obama Administration, led by the special representative Richard Holbrooke, sought to lessen the mistrust by launching a "strategic dialogue" with Pakistan's military and intelligence leaders, as well as with Pakistan's weak elected civilian politicians. By early 2011, however, that effort had failed. In late January of that year, on a street in Lahore, Raymond Davis, a C.I.A. contractor, shot and killed two men who he believed were trying to kill him, touching off a furor. I.S.I. leaders felt that the C.I.A.'s unilateral operations inside Pakistan had got out of control. Now, when civilians died in drone strikes, I.S.I. helped to whip up public protests.

"That anti-American narrative was basically sponsored by the Army and I.S.I.," Ahmed Rashid, a Pakistani journalist and the author of "Descent Into Chaos" (2008), an investigation of Pakistan's borderlands after the American invasion of Afghanistan, told me. "We all knew it was being orchestrated. The Americans knew, the public knew, the Pakistani media knew. But nobody said anything. Nobody had the courage to say anything." In Washington, evidence that I.S.I. was exploiting C.I.A. strikes to stir anti-American sentiment reduced what incentives the Obama Administration might have had to own up to genuine mistakes: to do so would only play into I.S.I.'s hands.

Still, around this time, as C.I.A. drone operators became more experienced and the technology improved, they shifted away from targeting terrorist "hideouts" and *hujras* and toward targeting militants' vehicles, according to the FATA ledger of drone strikes. Between March and August, 2010, two-thirds of all C.I.A. drone strikes in North and South Waziristan killed people in compounds or guest-houses. During the next six months, more than half of the strikes hit cars, jeeps, or motorcycles.

The Obama Administration might have benefitted from describing in public how it was adjusting tactics to spare innocent lives. It might have investigated reported errors and compensated survivors, as the U.S. military has done routinely since 2005 whenever it mistakenly kills civilians in Afghanistan. Instead, the law and the logic of secrecy surrounding the C.I.A. campaign silenced the Administration. Jon Stewart riffed freely about drones on "The Daily Show," but at the State Department, a former official there recalled, "we didn't even know if we were allowed to write the word 'drone' in an unclassified e-mail."

The real mistake, according to Ahmed Rashid, was that the C.I.A. went along with Pakistan's hypocrisy in denying that it knew anything about the drone program. To cover up Pakistan's official lies, the United States undermined its own credibility. "Somewhere along the way, the Americans should have drawn a line," Rashid said.

Datta Khel lies about twenty-five miles southwest of Miranshah, toward the border with Afghanistan. Near the town's market and bus depot is an open area suitable for an assembly. On the morning of March 17, 2011, roughly thirty-five maliks, government-approved tribal leaders, had gathered for a *jirga*, a traditional dispute-resolution meeting. The subject was a feud over a chromite mine.

"There were two tribes in the area, Manzarkhel and Maddakhel," the tribal leader Malik Jalal told me. "The dispute was between these two tribes. They were taking chromite out, but there was a question of who owned what." The Pakistani government knew

of the *jirga* session. *Khasadars*, or local police, paid by the government, were in attendance, according to court filings.

That morning, Jalal was a little more than two miles away. “I could see the drones in the air, and I actually saw the missiles fly and then heard the explosions,” he said. “When I reached the spot, I saw many body parts.” The FATA government’s contemporaneous ledger of strikes recorded that forty-one people died, and it noted, “The attack was carried out on a *jirga* and it is feared that all the killed were local tribesmen.”

Angry protests erupted in Pakistan. A few Taliban may have been present at the *jirga*, but the majority were not anti-American fighters, Pakistani officials told reporters at the time. General Ashfaq Kayani, then Pakistan’s Army chief, issued a rare public statement of dissent about C.I.A. operations: “It is highly regrettable that a *jirga* of peaceful citizens, including elders of the area, was carelessly and callously targeted with complete disregard to human life.”

The Obama Administration took a hard line. All of the dead were “terrorists,” an anonymous American official told the *Times*. “These people weren’t gathering for a bake sale.” The Associated Press quoted an anonymous official offering the same talking point: “This was a group of terrorists, not a charity car wash.”

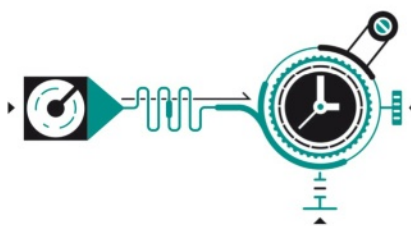
C.I.A. drones had been unusually active in North Waziristan in the days before the *jirga* strike. On March 11th, drones struck a “suspected vehicle boarded by militants,” according to the Pakistani ledger. That evening, a drone bombed a village. Two days later, a drone blew up a “state car” travelling across North Waziristan. On March 16th, a drone destroyed a compound near Datta Khel. From the available evidence, it seems likely that C.I.A. targeting analysts tracked a suspect to the *jirga* and then decided to kill everyone present.

Afterward, Obama ordered a suspension of C.I.A. drone strikes, according to a former Administration official. No strikes took place in Pakistan for almost a month. But the former official said that Obama authorized an exception to his freeze if the C.I.A. located a “high-value target.” When drones

struck South Waziristan, in mid-April, a debate erupted in the White House about whether the C.I.A. had violated Obama’s order.

Cameron Munter, the U.S. Ambassador in Islamabad at the time, and now a professor at Pomona College, had expressed his deep concern to his intelligence counterparts in both Islamabad and Washington about the extent of drone killing. Munter believed it had got out of hand and was destabilizing Pakistan. According to Mark Mazzetti’s “The Way of the Knife” (2013), Munter thought the timing of the *jirga* strike was “disastrous.” After that attack, he argued again to the C.I.A. that it would be a good time to cool down. “The drone strike on March 17th, it exploded—it was just huge,” Munter told me. “But, you see, dealing with people at the C.I.A., when I raised it with them, they said, ‘You know this is a never-ending war. Whose side are you on?’”

If the Raymond Davis case and the *jirga* attack strained U.S.-Pakistani relations, the Navy SEAL raid that killed bin Laden, on May 1st, upended them. Kayani and other top generals felt humiliated that they had not been informed in advance. The fact that bin Laden had been hiding less than a mile from Pakistan’s principal military academy raised the obvious question of who in Pakistan’s establishment might have helped him. In what appeared to



be an assertion of the C.I.A.’s freedom to operate independently in Pakistan, the agency resumed drone strikes in North Waziristan five days after the SEAL raid, at about the same pace as before.

In June, John Brennan appeared at a public seminar on counterterrorism at Johns Hopkins University. Clearly referring to drones, he said, “Nearly for the past year, there hasn’t been a single collateral death, because of the ex-

ceptional proficiency, precision of the capabilities that we’ve been able to develop.” That claim would have encompassed the *jirga* strike and a hundred and twenty other strikes in North and South Waziristan dating back to the previous summer, including at least a dozen cases in which nongovernmental researchers have found probable civilian deaths.

On November 16, 2011, C.I.A. drone operators killed a twenty-three-year-old American citizen, Jude Kenan Mohammad, during a nighttime signature strike on a residence in Babar Ghar, in South Waziristan. His death was confirmed only eighteen months later by Attorney General Eric Holder. The C.I.A. apparently did not know of Mohammad’s presence in the house.

Mohammad had come of age in Raleigh, North Carolina, and had fallen in with aspiring jihadists; his presence at the site of the attack might indicate that he had become a volunteer soldier. Yet he was not targeted for death as an individual, and, given his American citizenship, any deliberate strike on him would likely have to have been authorized only after an in-depth review overseen by President Obama.

In April, 2012, George Stephanopoulos questioned Brennan on the subject of drones: “Do you stand by the statement you have made in the past that, as effective as they have been, they have not killed a single civilian? That seems hard to believe.”

“Well, what I said was that over a period of time before my public remarks that we had no information about a single civilian, a noncombatant, being killed,” Brennan replied.

In fact, Brennan had not used the “no information” formula in his remarks at Johns Hopkins the previous year. And his epistemological defense indicated why it has proved impossible to reconcile the large gap between the Administration’s count of civilian deaths and those of the Pakistani government and nongovernmental researchers. The C.I.A. has never explained the criteria it uses to count a drone victim as a civilian. Nor has it described what sort of interviews or field research, if any, the agency’s analysts undertake to investigate possible mistakes. According to a May, 2012, *Times* article by Jo Becker

and Scott Shane, “Obama embraced a disputed method for counting civilian casualties that did little to box him in. It in effect counts all military-age males in a strike zone as combatants . . . unless there is explicit intelligence posthumously proving them innocent.” In briefings to congressional intelligence committees, the C.I.A. has disputed that characterization, saying that any person deliberately targeted must be associated with a known fighting group or enemy facility, or else be observed preparing for violence.

After the interview with Stephanopoulos, Brennan, during a speech in Washington, further qualified his claims about the precision of drones. “Despite the extraordinary precautions we take, civilians have been accidentally killed,” he said. “It is exceedingly rare, but it has happened.” He added, “We take it very, very seriously. We go back and we review our actions.”

By mid-2012, Obama had ordered Brennan to reassess drone policy. The following spring, at the National Defense University, the President announced a new policy for American drone operations, which remains in effect. The full rulebook is highly classified. Yet Obama did make one new standard public. Before striking, drone operators must determine to a “near certainty” that no civilians are in harm’s way—a considerably tougher standard than the C.I.A.’s original one, which dates to the Bush Administration.

Ned Price, a National Security Council spokesman, while declining to discuss any C.I.A. operations, said that Obama’s “near certainty” standard was “the highest that we can set.” He added, “In those rare instances in which it appears noncombatants may have been killed or injured, after-action reviews have been conducted to determine why, and to insure that we are taking the most effective steps to minimize such risk to noncombatants in the future.”

In early 2013, Obama asked Brennan to lead the C.I.A. The President appointed as Brennan’s deputy Avril Haines, a National Security Council lawyer who had worked on drone-strike rules and operations. The number of drone strikes carried out in Pakistan fell. Since Brennan became C.I.A. director, according to the data compiled by the Bureau of Investigative Journalism, there has not been a single documented civilian casualty, child or adult, as a result of a drone strike in Waziristan.

Obama’s experience of drone war—including the criticism he has received from international lawyers and human-rights groups over civilian casualties—may have motivated him, last year, to tighten targeting oversight, albeit in secret and while evading accountability for errors made early in his Administration. Yet the President and his advisers don’t seem to accept how little credit the United States is ever

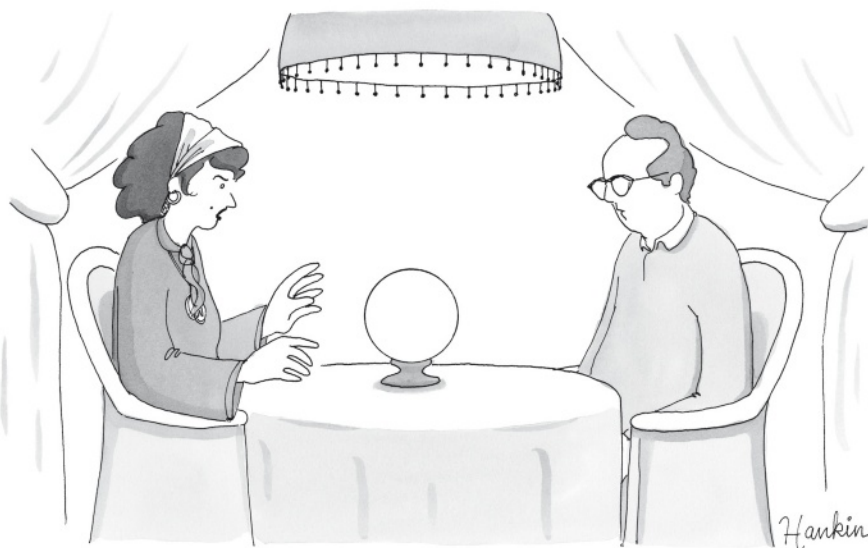
likely to receive from targeted populations just because it chooses to bomb with more accurate drones. On the ground in North Waziristan, drone war doesn’t feel much different from other forms of air war, in that many civilians are displaced and frightened, and suffer loss of life and property.

Despite the drone campaign’s measurable successes—diminishing the influence of core Al Qaeda, the group around bin Laden that once planned international attacks from Waziristan, and of Al Qaeda in Yemen—the terrorist movement has assumed new shapes in Syria, North Africa, and elsewhere. Pakistan, Yemen, and Somalia are still beset by jihadist violence.

In a research paper published this summer, Micah Zenko and Sarah Kreps, two scholars at the Council on Foreign Relations, argued that the very precision of drone technology raises the prospect for “moral hazard.” The reduction in risks may tempt governments to order drones into action more frequently than they would conventional bombers or missiles. In other words, drones may spare more innocents but they may also create more war.

“I think the greatest problem is the mentality that accompanies drone strikes,” Philip Alston, an N.Y.U. law professor who investigated drone attacks for the U.N. between 2004 and 2010, told me. “The identification of a list of targets, and if we can succeed in eliminating that list we will have achieved good things—that mentality is what drives it all: if only we can get enough of these bastards, we’ll win the war.”

One Sunday evening in Islamabad, as pre-monsoon storm clouds blew over the Margalla Hills, I crossed the city’s checkpoints to reach the French Club, an oasis notable for the imported liquor in its private bar. I accompanied Mirza Shahzad Akbar, a club member. During the Musharraf years, Akbar, a Pakistani lawyer who was trained in London, investigated political corruption for the government. Later, he joined a private firm to serve corporate clients. Four years ago, inspired by an American human-rights lawyer he met in Pakistan, he decided to leave his law firm for the Foundation



“@FBarnes12 favorited a prophecy you were mentioned in.”

for Fundamental Rights, which he now leads. He spends his days working with investigators like Noor Behram to collect photographic evidence and sworn testimony about drone-targeting errors, and to advance lawsuits against the Pakistani government, the C.I.A., and sundry American officials.

Akbar is a portly man, partly bald, with a Vandyke beard. Like many members of the Pakistani élite, he is well versed in global media culture. We discussed “Homeland,” contenders for the 2016 U.S. Presidential election, and European politics. Later, at his law office, we talked for hours about drones. What sets Akbar apart from Pakistan’s privileged class is his passionate advocacy for clients from a population that has virtually no influence or voice even within Pakistan, let alone in Washington: the residents of North and South Waziristan who do not wish to fight in a war.

“When I enter a party, people say, ‘It’s the Taliban’s lawyer,’” he told me. “There are lots of jokes. I’ve stopped saying what I do.” His friends argue vehemently, he continued, that while “it’s bad if there are a few civilian casualties” from drones, “there is more damage caused by Pakistani F-16s, and, anyway, if we don’t stop them they’ll take over and we’ll all have beards and our wives and daughters will be in burkas.”

When I asked how he answered that argument, he replied, “If we’re true liberals, we should also protect the rights of the Taliban.” (His foundation does not litigate on behalf of militants or their families.)

Akbar has trouble getting visas to travel to the United States. After he sued the C.I.A., he said, his car was stolen and his office was trashed—events that he assumed were not random. Obama Administration officials, speaking anonymously to the *Times*, once accused Akbar of fronting for I.S.I. in order to harass the C.I.A. He and his supporters in the West deny that. His foundation’s financial support has come mainly from the Bertha Foundation and Reprieve, the British human-rights group. After his lawsuits received widespread publicity in Pakistan, low-level I.S.I. officers visited him a couple of times; he told them that he



“Tell me my origin story.”

was serving Pakistan’s interests, and they have left him alone.

For Pakistani human-rights advocates, the drone war in Waziristan poses a problem of lesser evils: which is worse, American bombing or Taliban revolution? Taliban suicide bombers have killed thousands of civilians in Pakistan’s cities, and the movement is loathed and feared. In June, the Pakistani Army launched a major assault on the Taliban in Waziristan. C.I.A. drones reportedly struck Uzbek militants during the operation. Over all, the Pakistani Army has fought the Taliban to a stalemate, but the group’s adherents have gained influence in areas of Karachi, Pakistan’s commercial capital, and can still launch successful attacks even in Islamabad. Many Pakistanis understand all too well that their government lacks the competence and the credibility to suppress the Taliban. Some among the élite, therefore, welcome—or, at least, accept—the C.I.A.’s drone strikes as a necessary, temporary compromise.

“From Day One, I’ve been saying, I’m not against drones,” Akbar said. “It’s

just a machine. It’s more precise than jets. But it’s only as precise as your intelligence.” Collecting target information from the sky is difficult; so is gathering information from a semi-hostile partner on the ground, like I.S.I. Akbar wondered aloud if I.S.I., to discredit the United States in the eyes of Pakistanis and the world, might “sometimes give the C.I.A. false targeting information.” It would not be surprising.

For as long as the United States does not openly acknowledge targeting errors or pay compensation for victims, and for as long as the Pakistani government lies to the public about its complicity in drone killings, the images of dead civilians that Akbar’s investigators collect and publish will resonate. “This is not about taking the Taliban side or the American side,” Akbar said. He believes that the United States should hold itself to a higher standard than the Pakistani government. “Our work has been about the fact that there is no transparency or accountability in the U.S. drone program in Pakistan.” ♦

FICTION

B R A D W A T S O N

Fykelm



Where had they come from, the Eykelbooms? The boys suspected Indiana, Illinois. Some crude and faceless Yankee state. The Eykelbooms had emerged and emigrated from it. It was a tiny, deeply threatening invasion. The boys watched them unpack their moving truck, which was actually a dump truck, their belongings piled into the bed and covered with a large heavy tarp. The truck belonged to Eykelboom's father. No one else on the street owned a dump truck, and this might have been cool had the owner of the truck not been Eykelboom's father.

They weren't neighborly, of course, aside from Eykelboom himself, an only child, who tried to befriend the other boys, to no avail. His parents made no effort to help their son or to make any friends themselves. His mother almost never appeared outside the house, except for trips to the grocery store, and his father did only when he drove the dump truck to and from work, blowing his customized musical horn to announce his arrival, which everyone came to truly despise, or when he was mowing the grass on weekends. He did this shirtless, as if to show off his physique. He was tall, with a big rectangular head, a flattop haircut that wedged to a point over his small, square forehead, and droopy, arrogant eyes. Long loose limbs that looked apelike and strong, huge hands and feet, but thin and wiry legs as if he'd descended from a jack-rabbit or some fleet herbivore. As he pushed the lawnmower back and forth across the grass, he sucked in his gut like a movie actor. You could always tell that it was sucked in because it wasn't muscled, just smoothly concaved by the sucking. Eykelboom walked around doing the same thing, sucking in his belly, sticking out his chest, atop which stood the same long neck, slack face, flattop haircut. He was slighter and softer than his old man, gangly. He ran with his head thrown back, legs flailing, chest thrust forward as if to break the wire.

Eykelboom's old man didn't like Eykelboom much, either, which was a pretty awful thing, even to the boys.

The boys wore cutoff jeans and faded torn T-shirts, went barefoot or in begrimed old sneakers without socks. They had blackened fingernails and knuckles, tired-boy eyes, scarred knees and elbows and ears, snotty noses, unwashed hair

spiked with sleep and itchy with sand, scabby stubbed toes, unbrushed teeth flecked with tomato peel and pieces of grass. They got around on foot or on one of a squad of banged-up bicycles that seemed interchangeable and were left crashed into shrubbery or tangled at the center of a forlorn front yard or askew in the street like the rusted remains of extinct, mechanized animals.

Eykelboom, neatly dressed, clean, quiet, was not a troublemaker, as far as the other boys could see. Yet every so often his father would come out of the house, call to him, and stand there waiting. Eykelboom's face would blanch, he would freeze for a moment, then mutter something fatalistic and trudge over to his old man. Together they would turn and go into the house, and the boys wouldn't see Eykelboom for a couple of days. They might see him being driven to school by his mother instead of taking the bus, but he never looked out the car window. At school, he kept his head down, staring at the book on his desk, sat alone in the cafeteria, and somehow disappeared at recess. Then one day he'd be back, attempting once again to be their friend. What he had done to bring down his father's wrath no one knew. Some private transgression. But once the boys realized that they could use it against him they did.

Of course, it was common in those days for parents to hit their children, with everything from hairbrushes to toilet brushes, flyswatters, switches, bare palms, rolled newspapers, and folded belts. But, usually, there was a good and obvious reason.

The boys couldn't be sure, but it seemed like Eykelboom's old man did it just to do it, to keep the boy in check. Secretly, they envied him this. Their fathers were generally ineffective, weak. They were low-ranking white-collar, nervous, inattentive, soft, unhappy. In a way, they were not even there.

I'd like to see it, the older Harbour twin said. I'd like to watch.

That's pretty sick, said Wayne, a brooding olive-skinned boy whose father was a temperamental judge whom everyone except Wayne seemed to fear. You're a fucking freak, he said.

Wayne and the older twin wrestled, making high whining sounds, and then stopped when Wayne pinned the twin, who got up and walked off up the hill to-

ward his house, sulking. Wayne stood there panting, looking after him. Then he stared for a while at Eykelboom's house before heading off toward his own, without speaking to the other boys.

Eykelboom was not supposed to play in the big drainage ditch at the end of the street, down near the turnaround. It was not a cul-de-sac, as no one had ever heard the term. Plus a cul-de-sac should have houses rimming its perimeter, houses with neat yards and diagonally symmetrical lots, whereas one part of this turnaround was bordered by a bamboo-filled ravine; another by a dirt path that led to a small bass-and-bream lake infested with water moccasins; and a third section opened up to a big new house with a low-lying front yard that filled with brown water every heavy rain. Just before you reached the turnaround, on the north side of the street, a buried storm drainpipe that ran from the top of the hill down to the bottom emptied out into the drainage ditch. The sandy earth there had eroded into a small gully that threatened to undermine the street itself. The boys built dams in the storm runoff that came from the pipe, dug treacherous caves into the sandy bank, hid in the ditch to lob dirt clods at cars that had come down their street by mistake, thinking it a throughway. Their parents didn't worry about the ditch, believing that the boys had sense enough (they did not) to be careful and look out for themselves. But Eykelboom's family was from someplace very different, and Eykelboom's old man did not allow him to run loose. He was expressly forbidden to go into the big drainage ditch.

Nor was he allowed to run loose in the dense tract of virgin forest that began just behind the houses on the north side of the street. These woods were owned by a cantankerous old man named Chandler, who lived in an old plantation-style house perched on the edge of the woods as if he were the resident troll whose mission it was to guard them. Chandler had once owned the land under the boys' houses, too, before the developer bought it from him and paved what had been a dirt road to the lake and built a dozen small ranch-style houses on a dozen small lots, six on either side of the street. At the end of the turnaround was the big house that the developer had built for himself.

When Eykelboom declined to go into

the woods, the boys called him a coward and headed in without him. He stood in the street and watched them cross a vacant lot to the section of barbed-wire fence where they normally entered the woods. Then he called out, Wait, I'm coming, and rushed to join them.

There was a creek that ran the length of the woods. At its lowest point it widened into a series of waist-deep, muddied pools, creating a swamp. In the clear, shallow areas of the creek higher up, there were minnows and tadpoles, and crawfish to catch. But the pools were murky and more likely to harbor snakes and snapping turtles, so the boys avoided them.

They took Eykelboom on a tour of their main trails through the woods. They pointed out areas that even they hadn't explored, then doubled back and showed him the layout of the creek from near its source down to the pools. When the boys saw that he was standing on a spot that had been weakened by the creek's current, they exchanged glances but said nothing. The bank gave way and Eykelboom plunged into a pool up to his belly. The boys pulled him up, but he was inconsolable.

My dad's going to kill me, he said.

Why don't you just get wet all over, and you can say someone sprayed you with a hose? the older Harbour twin said.

It won't work, Eykelboom mumbled. It won't matter.

Why don't you just go change before he gets home from work?

She'd tell him.

Well, someone else said, we'd better hide out in the ditch and hope you can dry in the sun before your old man comes home.

It was the younger (by five minutes) twin who said this. The twins were not identical. The younger one looked like a boring businessman shrunk to the size of a child. The older one was taller but as scrawny as a starved stray cur.

Eykelboom reminded them that the ditch would only make it worse. He looked like he was about to cry. A couple of the boys felt sorry for him, along with a vague annoyance.

Actually, Wayne said, the woods would be worse.

He seemed very calm. Eykelboom was bringing something out in Wayne.

It's not just someplace you're not supposed to be, Wayne said. It's trespassing.

We could all go to jail just for being here.

The boys looked at Wayne. They knew that the woods' owner, Mr. Chandler, hated them because they built forts and camped out in there and of course made campfires, which meant that they could potentially start a forest fire and burn it all down. This was a small and pristine forest where some older boys swore they'd seen an ivory-billed woodpecker, supposedly extinct for longer than the boys' parents had been alive. But the boys' parents seemed to think nothing of their trespassing in Mr. Chandler's woods. If they knew that Chandler hated the boys being in there, they showed no sign. Chandler sometimes used his shotgun when he detected the boys' presence in his woods, striding into his great back yard and firing off loads of bird shot that pecked down through the broad low canopy of leaves like a shower of rain. Once the middle McGowen brother took a pellet on the pad of his pinkie finger. The finger stayed swollen for a week. His older brother advised him to say it was a bee sting.

Now, after Wayne's words, the boys were having visions of prosecution for trespassing, a previously unthinkable prospect. A squad of deputies would be dispatched to the woods to round them up and take them to juvie lockup, inking and logging their filthy little fingerprints, taking their urchinesque mug shots, interrogating them, hauling them to court, tossing them into some kind of Boys Town chaos of a prison.

Then Wayne said, There's nothing else you can do. You have to go hide in the ditch. It's too shady in here. You'll dry out in the sun and your old man will never know.

The boys all knew he wouldn't dry out there. It was a humid day. One of those days when their mothers had to leave the wash on the line for a second or third day to dry it fully. The boys knew that Eykelboom was fucked, either way, that it was just a brief matter of time before his old man would come home in his ridiculous vehicle, rolling down the hill blowing his ridiculous melodious horn as if everyone, as if anyone, would be delighted to know that he was home again, home again, and that as soon as he went into the house and said, Where's Ikey? and Eykelboom's mom said, I don't know, he's been out all afternoon with the other boys, Eykel-

boom's old man would be out in the street himself, hands on his hips, so you could tell even with a T-shirt on that he was sucking in his gut to look like he did calisthenics and never ate anything other than raw lean meat, calling out Eykelboom's name in a voice that said as clear as God's that he was planning on putting some kind of hurt on Eykelboom.

They waited, squatting low, watching the dirty water trickle from the big pipe and down the drainage stream. Every few minutes one of them climbed up to peek over the rim of the ditch to see if a car was coming down the hill. On the far wall of the ditch were the ruins of the caves they'd built earlier in the summer. They'd built four of them. Wayne's had been the most elaborate, with two chambers, the smaller just large enough for Wayne to crawl into and curl up like a baby. They'd come out one morning to find them all destroyed. Someone had taken a shovel and caved in the caves. Someone afraid that his child would be in there when the sandy soil above collapsed and smothered him. It could have been anyone, really, someone's parent or even a city worker cruising by on inspection. But the boys knew it had been Eykelboom's father. They imagined him sneaking down there in the middle of the night with a shovel and a flashlight. No one else had seemed to notice the caves. No one else hated the ditch. No one else was so aggressive. Their fathers did not take action. The boys' fathers tended to ward off worldly trouble with idle, half-hearted swats as if at lazy bees. Eykelboom's old man, although odd, even laughably weird, was potentially frightening, very humanly alive. They couldn't even greet him, Hello, Mr. Eykelboom, without getting a smirk in return, as if they had tried to speak but had failed because they were retarded. Sometimes he even laughed at them. They were terrified of him. They wanted not to kill him but for something stronger than themselves to crush him.

As for Eykelboom's mother, they knew nothing, although they assumed that she was at least somewhat like their own mothers, sometimes angry and sometimes sad, obsessed with the outrageous burden of housework and cooking, even if they had paying jobs as well. Women who rushed out of their back

doors to smoke, pacing, on the patio or as far from the house as possible, who could not be spoken to until it was bearable for them to be in their lives again, which could take minutes, hours, or days.

A car came down the hill and the boys hunkered low. It whooshed past, fast and unseen, and turned in to the long drive of the developer's house at the end of the turnaround. The developer and his wife zoomed up and down the street, and occasionally waved but never stopped. The boys had waved back when they were younger and the street was newer but they did not anymore. They realized that they were negligible. Occasionally someone's dog or cat that lacked sense or agility was crushed beneath one of their big, sleek cars. The developer's wife would come and apologize. She seemed gigantic, loud. Her teeth were enormous. They feared her. Like their parents, they toiled in the developer's fields like serfs, outwardly quiet and obedient. They took out their need for violence upon one another.

After they heard the developer's car door open and shut, they heard Eykelboom's father's dump truck turn onto their street. They heard it come over the top of the hill and slow with a throaty downshifting of gears, and heard the horn blow out its melody, the opening bar of "Dixie," which was idiotic, not to mention deliberately provocative, given that he was from Indianaland. They heard the truck lunge into the Eykelbooms' driveway and stop. They heard Eykelboom's father get out and go into the house.

Eykelboom's eyes in his long, heavy head were wide open, limpid, staring at nothing. He squatted there very still, wet and steaming in the sultry heat. Then they all heard the Eykelbooms' front door open and shut again. Eykelboom seemed to be holding his breath, his lips trembling. His father called out in a hard low tenor, a voice all the stranger for being rarely heard in regular speech.

Emile! he called. Emile!

He called Eykelboom Ikey only when he wasn't mad.

Eykelboom closed his eyes, took a deep breath through his nose, and let it out.

I better go on up, he said.

Wayne said, Let's sneak out the back way into the woods.

The boys looked at Wayne. He was looking at Eykelboom in a way that was

meant to seem very casual but was actually very intense, as if no one else were there but Eykelboom and Wayne.

Eykelboom said, It'll just be worse if he has to come get me.

He squatted there a moment more, then stood and said, I'll see you guys, and climbed the side of the ditch and onto the street. They could see his father standing beside the dump truck, waiting on Eykelboom, who trudged along like a boy condemned, arms at his sides, big flattop head hanging down. His father didn't even glance at the boys peeking up over the edge of the ditch as he slowly pulled his belt from its loops, folded it in half, and stood waiting, yea, like an executioner, the leather belt hanging from his big, bony right hand, his wire-rimmed spectacles gleaming in the light. When Eykelboom reached him, neither said anything. The father turned and followed Eykelboom through the carport and into the house.

The younger twin said, derisively, You guys, in an exaggerated Yankee accent. Then his brother said, in the same tone, Emile. He said, He's beating the shit out of *Emile* right now. The three McGowen boys said nothing, their small similar mouths squinched up.

The middle brother looked at Wayne, who was staring at the Eykelbooms' house with his eyes half-closed and his mouth slightly open, as if he were daydreaming or lobotomized or asleep on his feet. Then just his eyes moved and he was

looking back at the middle brother, who felt electrified by his stare and struggled to look away.

It was a while before they saw Eykelboom again.

They almost forgot about him. They forgot to hate him.

Then one day he stepped out from behind a large shrub that grew wild in the middle of the vacant lot and followed them into the woods without their knowing it. One of their forts was a four-story tree house built with lumber stolen from an outbuilding below Mr. Chandler's house. It was an old servants' quarters that had been overtaken by kudzu and brush and it was far enough away from the main house and dilapidated enough that the boys had been able, like insects or spirits, to dismantle it from beneath the kudzu's cover. They worked at it furtively, slipping pieces of the little house into the throat of the woods without once alerting Mr. Chandler.

They'd built the tree house on a hill, the first floor six feet above the ground, using three large straight pines as its foundation beams. The trees formed a rough triangle and the boys had nailed the floor joists into the trees, laid the floorboards across these, built the walls without openings except for a narrow strip between the wall and the next floor, and then nailed on more boards to form a flat roof, which served as the floor of the next story, until they had four levels. They'd stolen the



"Are these the Top Ten Commandments?"



"Do you have any idea how fast you were evolving?"

remains of a roll of tarpaper from a construction site and laid sheets of this over the roof of the top room. The only entrance was a small hole in the floor next to one of the trees, which they climbed using pieces of two-by-four nailed into the trunk as a stepladder. There was also a hole in the ceiling of the top room, so that they could stick their heads out and watch for the approach of Mr. Chandler or one of their parents. Once, the twins' mother had drunk too much gin and wandered into the woods and been lost until the boys found her, standing in a small clearing in her nightgown, barefoot and weeping.

On this day, one of the twins was on the roof for only a minute or so before coming back down.

He said, Eykelboom's down there.

The boys were incensed that Eykelboom had followed them to this fort. It was their newest and grandest fort and they had not shown it to him when they had given their tour. Wayne climbed up through the lookout hole and then climbed back down. He looked at the oldest McGowen brother, who turned to the middle brother and said, Go down there and tell him to go away.

What if he asks to come up? the middle brother said.

He can't come up, Wayne said. He's not allowed.

Make him leave, the oldest brother said. Go on.

The youngest McGowen brother watched them from a dark corner, his eyes bright with excitement.

The middle brother slowly made his way down the ladder steps, floor by floor, and stuck his head out of the entrance hole when he reached the lowest level. There stood Eykelboom, gazing into the woods with a stoic, if forlorn, expression. The middle brother figured he had heard their discussion. Eykelboom fixed a strangely calm expression on him, and said nothing.

Ikey, the middle brother said. You have to go away.

That's right, Emile, one of the twins said from inside the fort.

Eykelboom looked suddenly angry.

I'm not going away, he said.

I can't let you in, the middle brother said.

You don't have the right, Eykelboom said. I can stand here all day if I want to and you can't do anything about it.

The middle brother pulled his head back through the entrance hole and looked at the other boys, who had climbed down to the first level to listen.

It's a free country, Eykelboom said then, louder. Which was such a Yankee thing to say.

Fred-e-rick, Wayne said in a mock-tired way, drawing out the middle brother's given name, a name that everyone knew he did not like. Climb down there and make him go away.

The middle brother whispered back, How?

Wayne's eyelids fluttered. He was smoothing the paper on a cigarette he'd lifted from his old man's pack. The boys had been planning to smoke it. Wayne put the cigarette into the corner of his mouth and spoke.

Beat. His. Ass.

The middle brother did not want to go down there and beat Eykelboom's ass. Eykelboom was big, and like his brothers the middle McGowen was small. But he couldn't not do it. He would become lower than Eykelboom. With a swelling of sadness and doom in his heart, he descended the two-by-four ladder to the ground.

Eykelboom had crossed his arms like a stubborn, determined person on a television show, like in a musical movie or something. He was even taller and broader than the middle McGowen brother had realized. He reached out and gave Eykelboom a push, to no real effect, and Eykelboom looked away, reddening. The middle brother pushed him again, harder, and Eykelboom let out a high-pitched wail of rage. He flailed at the middle brother with his long heavy arms, landed one big blow against the middle brother's head, and turned to leave.

The middle brother reeled and his head rang with the blow but then he heard something and saw Wayne peering at him through the entrance hole. Wayne said, Are you going to let him just do that to you?

The middle brother caught up with Eykelboom and leaped onto his back as if he were riding piggyback. Eykelboom twirled like an off-kilter top but the middle brother hung on, afraid to let go. They spun toward one of the fort's foundation trees and slammed up against it. The middle brother fell off without a word and Eykelboom ran away toward his house, keening in his outrage and grief. Possibly it was outraged grief. The middle McGowen brother lay on the ground, stunned. Wayne stuck his head through the entrance hole and looked down at him for a moment.

Way to go, he said. Come on up.

The middle brother roused himself slowly and climbed back into the fort. The boys lit and smoked Wayne's cigarette, passing it around. The middle brother took a puff and passed it on.

You did good, his older brother said to him.

But he didn't feel good about any of it. He was using every bit of will he had not to cry, which would have made it all even worse.

Eykelboom disappeared. He wintered in his brooding or became as spectral as a ghost, there but not there in any evidence. Then summer came again and he drifted or sifted back into visibility, though he kept himself peripheral and quiet. He didn't try to merge. He didn't speak much or look at anyone directly. He'd changed, still angry but also disaffected, detached. The boys saw him do things on his own. Leave his house and go into the ditch without apparent concern, then disappear out of it into some other place, down to the lake, or into the woods, emerging hours later seeming unchanged. Sometimes his old man would be waiting for him, sometimes not. It didn't seem to matter. He affected or displayed a studied nonchalance, leaving his father to look weak somehow as he stood waiting in the driveway holding his belt, or just balling up his rawboned workingman's hands as if they contained all his rage, his face showing nothing.

Once Eykelboom stayed out in the woods all night at one of the boys' forts, the oldest one, now abandoned deep in the woods. The boys found the evidence days later. Ashes and burned logs in the pit from a fire they hadn't made. A ball of blackened foil in the ashes that had helped cook something they hadn't eaten. What looked like Eykelboom's big sneakers' prints in the soft dirt around the pit. How he had got away with that, they had no idea. Then they realized that he probably hadn't but didn't care.

Things began to happen. The long-abandoned shack on the lake's far bank burned down. It had once been a caretaker's cabin. The boys had planned to steal its lumber for a new fort. The police, in the paper, called it arson. A girl's stolen bike was found down in the bamboo, looking as if someone had smashed its frame with a sledgehammer. A row of

new saplings in the Porters' immaculate yard was destroyed, every trunk snapped. The twins' dog Bummer, a giant golden retriever so ancient that he never left the carport anymore, vanished one night, his body never found. The boys knew it was Eykelboom. Wayne went up to him and said so.

He said, We know it's you doing all this crazy shit.

So what if it is? Eykelboom said.

So you'll pay for it, Wayne said.

Says who?

If you killed Bummer, the older twin said, you deserve to die.

Eykelboom stood there with his chest poked out, like his old man, staring back at Wayne.

Says me, Wayne said. Says we.

You can't hurt me, Eykelboom said. You can't prove I did anything. And you don't hate me any more than I hate you. So fuck you.

None of the boys had ever actually had those particular words said directly to them before, nor had they quite used them yet. Wayne stood chest to chest with Eykelboom. Then Wayne gave him that half smile and walked away. Eykelboom didn't move. He looked around at the other boys. They looked back for a moment and then went home. Before going into the house with his brothers, the middle McGowen brother glanced back. Eykelboom was still there in the fading light in the vacant lot across the street from his house, looking at nothing.

He didn't exactly disappear again. He slipped in among them now and then, silent or all but so, like a strange intelligent dog, a stray. He slipped in when they were out in the twilight, one minute not there and the next minute beside them. It was spooky. One night, in just such a moment of quiet apparition, they heard Mr. Chandler's horse down in the woods. It sounded as if it were being attacked. The shrieking sound it made prickled their skins. Mr. Chandler often let the horse run loose in the woods, but never so far as they knew at night. More than one of them had been almost trampled while walking along a narrow trail, hearing the hooves very suddenly near, diving aside as the horse came galloping by in a heavy, heaving, wheezy blur. He was a big bay stallion. When he got out of the barn he needed a run, and there wasn't a lot of open ground in the woods. The meadows

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tended to be small, no more than thirty or forty yards across. So this horse was a woods horse and he ran the trails. And maybe, they figured, that desire to run the trails was also a product of fear, because the older boys always said they'd seen bobcats in there. A couple of them even said they'd seen a panther, or had heard it scream. The boys themselves had neither heard nor seen sign of a bigger cat, but a panther was not out of the question. In this place, in this time, in this small town bordered all around by woods and rural land, any animal wanting to broaden its territory needed only to cross a few two-lane, tree-loomed roads into this or another swath of undisturbed forest. There were deer in Chandler's woods, so why not panthers, too? When Mr. Chandler's stallion ran in the woods, he ran like a horse with his tail on fire, or a horse with a big cat swiping at his flank, a horse who never knew from which tree something might leap onto his back and sink fangs into the spine ridging his long, exposed neck. In short, whenever he got his exercise, this horse was effectively mad with terror. You didn't want to get in his way.

They heard the horse call out again. At first they stood very still and listened, and then Wayne said they had to go see. He came back from his house with a pair of flashlights, and Eykelboom followed them all in. They made their way across the vacant lot, through the fence, down the trail toward the swamp, the horse's trembly bellowing growing louder. Soon they saw lantern light glowing down in the swamp, and heard the voices of men in between the sounds of the horse. They left the trail and entered the swamp, picked their way across muddy grass islands toward the yellow glow. The air was chilled, and stank like rotten roots and sewage.

Kerosene lanterns hung from swamp tree branches, illuminating the horse, up to his withers in one of the black mud sinkholes. Two men who lived in old cottages behind Mr. Chandler's house were trying to get the horse out by levering him with thick pine boards stuck deep in the muck on either side of him. Mr. Chandler, his boots and pants heavy with mud, a battered town Stetson jammed down on his head, held a rope that was clipped

to the stallion's halter. The men helping were mud-caked head to toe, as if they'd emerged from the swamp itself to free the beast from their own sightless world. The boys stood in a bunch just outside the dissolving rim of the lanterns' light, perched on soft hummocks of unstable swamp grass and moss, constantly shifting their feet to knobs of firmer ground.

The boards and the men and the lanterns and Mr. Chandler's harsh commands made the horse more afraid, and he bucked helplessly in the sinkhole. He strained and trembled, struggling to pull his forelegs free, pushing with his powerful hind legs. Every now and then he raised his head and his neck went rigid and his eyes rolled around in fear and that awful sound they'd heard from the street came from his throat, through his long clenched teeth.

The middle McGowen brother heard Eykelboom just behind him. Eykelboom said quietly, If it was my horse I'd go ahead and cut its throat.

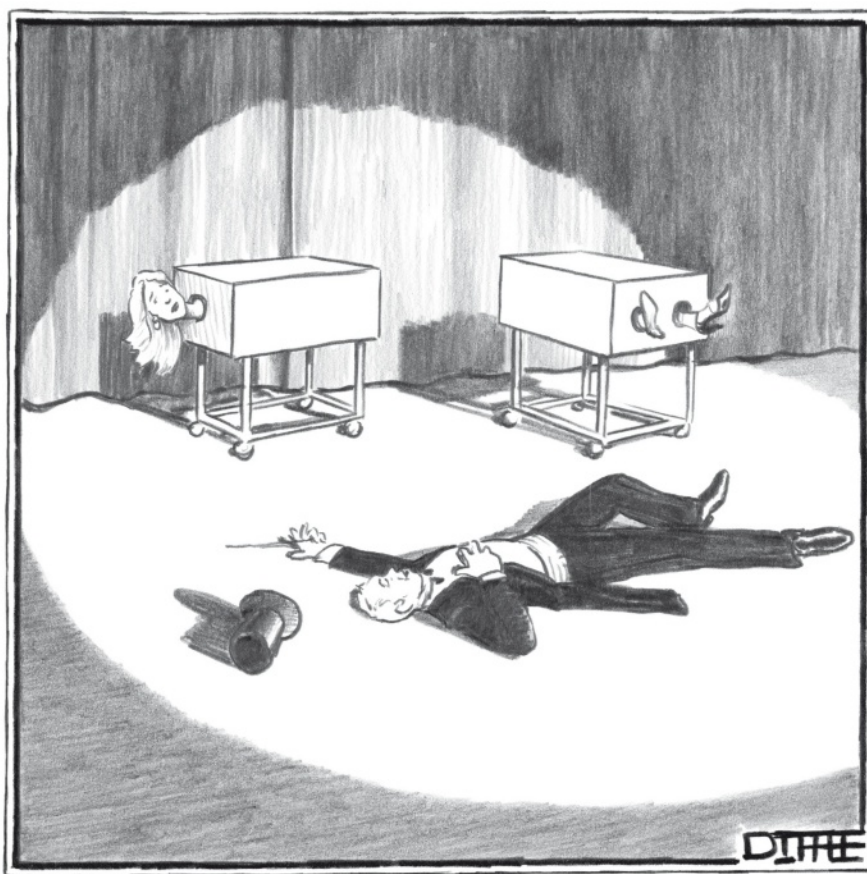
The middle brother looked over his shoulder and saw Eykelboom staring at the horse, as they all had been, but he didn't seem disturbed. Eykelboom pulled a Boy Scout knife from his pocket, opened the blade and felt the edge with his thumb, then folded it and put it away. The middle brother almost said, Are you in the *Scouts*?, but didn't.

The men and the horse worked so hard their bodies shuddered with fatigue. Finally the horse was able to free his forelegs and in a series of scrambling lunges he was out. He shook his big head and yanked the halter rope from Mr. Chandler's hands, knocking the old man into a sinkhole. He splashed straight for the boys, leaping from little island to island, busted past them with a blast from his nostrils, jumped the creek, and galloped away in the dark toward higher ground.

Help me out of this goddam hole, they heard Mr. Chandler say to the men. One of them leaned down to give him a hand, then took a lantern down from a tree branch. Mr. Chandler reached up for the other lantern and when he swung it around he saw the boys standing there like silent swamp elves.

You boys get the hell out of here, he said. You stay the *hell* out of my woods.

As they were leaving, they heard him ask one of the men to repair the fence around the swamp the next day. He said



"Is there a doctor in the house, and more importantly, another magician?"

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something about those little heathens having cut it. The middle McGowen brother wondered if this was true. If it had been Eykelboom. Or Wayne. He thought it was the kind of thing that either one of them might do. Wayne just to do it. Eykelboom with some inscrutable sense of purpose. Even a boy could tell that it was Eykelboom against the whole world.

Using Wayne's flashlights, they made their way back down the dark trails and crossed the fence out of Mr. Chandler's property. When Wayne said to Eykelboom, You know he's going to be waiting when we come out, they all stopped. Eykelboom stood there for a minute. Fuck him, he said, I'll just stay here. He turned and walked back into the woods.

When the boys reached the vacant lot, they could see Eykelboom's old man standing alone in his front yard, lit by the street lamp two houses down. He held something in his hand that wasn't a belt—a stick of some kind, thin like a thrashing cane. The boys stopped and looked back toward the dark woods. They glimpsed the faint contrast of Eykelboom's white T-shirt farther down the trail.

Eykelboom's father spotted them and called out, Where's Emile?

When he began to move toward them, they took off running.

They leaped over the fence back into the woods. When the younger twin caught his foot on the barbed wire and fell, hollering, they stopped to see if he was O.K. But Eykelboom's father was still coming toward them through the vacant lot, the stick in his hand, and they took off running again down the dark trail. They listened for Eykelboom ahead of them as they ran. Instead they heard his father, following. They ran in the dark on the trail that followed the creek to the crossing upstream. They tripped over vines and roots and stumbled in ruts but kept going. They scrambled down the upper creek bank, jumped the creek, and ran up the other side. They heard Eykelboom's father far back on the trail—he had no flashlight and didn't know these woods—calling out to his boy. The boys called out then, too—Eykelboom! Emile! Ikey! they called in turn.

They searched for an hour or so, then made their way back to the street. They left the woods at a different spot, crossed

the fence behind the Porters' yard, and peered out from the side of their house. A police cruiser was parked half on the street, half in the Eykelbooms' yard. Eykelboom's father was talking to a cop near the open door of the cruiser. His mother was there, just outside the carport, in a house robe. A couple of people stepped out of their homes, curious.

Cautiously, the boys went over. Eykelboom's father stiffened when he saw them. He still had the stick in his hand. He looked at the cop, then at the boys.

He said, What have you little bastards done with my boy? What have you done? I'll fucking kill you if you've hurt him.

It was hard not to run.

Then Wayne said, We didn't do anything to him. What're you doing with that stick in your hand? What were you going to do to him before he ran away?

What do you mean ran away? Eykelboom's father said. The cop peered at the boys from beneath his visor.

That's right, Wayne said. He beats Ikey all the time. He made him run off.

The cop's narrowed eyes moved from Wayne to the other boys to Eykelboom's father. He looked at the stick.

I'll handle this, Mr. Eykelboom, the cop said. Please put the stick down and go inside your house for now.

Eykelboom's father didn't move, just stood there, staring at Wayne. The boys tensed, thinking he might rush them.

Mr. Eykelboom, the cop said again.

Eykelboom's father slowly turned his head to look at the cop, then at the stick



in his hand. He gripped the stick even harder and went inside, walking past his wife without seeming to see that she was standing there in her robe and slippers, pale and speechless, her face drawn up as if there were no teeth in her head.

The cop asked the boys questions. Had they seen Eykelboom in the woods? Did they know where he might be? He got on the radio, talking.

There's a swamp in there, Wayne said, and told him about the horse and Mr.

Chandler and his men. The cop studied him for a long moment. Then he got on the radio again. He said something into the mic about Mr. Chandler. In a little while an old pickup truck grumbled down the street and parked next to the cop's cruiser and Mr. Chandler got out, wearing clean clothes. He talked to the cop, glanced at the boys, shook his head. The cop said something else and Chandler shrugged. The cop got on the radio again. Chandler lit a half-smoked cigar he'd pulled from his shirt pocket, leaning against his truck, gazing into the shadows of his woods.

Eventually, two sheriff's deputies dressed in hunters' overalls went into the woods with high-beam flashlights. Soon another cop pulled up with a dog in his car and they went in, too. Neighbors came out and gathered near the cruisers, whose lights were whirling and lighting up the houses and windows and trees in the yards. People shared coffee and beer, smoking, speaking in quiet voices. Occasionally someone said something that made others laugh and then stop themselves. Mrs. Eykelboom had followed her husband inside. After a while the neighbors went home. Chandler got into his truck and left. The boys were called home by their parents. The two younger McGowen brothers watched from the dark window of the bedroom they shared, in their house next door to the Eykelbooms'. They saw the deputies make their way out of the woods, looking beat. The cop with the dog came out. The police talked among themselves. Their radios squawked. They turned off their cruisers' flashing roof lights. Then an unmarked black car arrived. Two men in suits got out and went up to the carport. They talked to Eykelboom's father at the door. It looked like Eykelboom's old man wouldn't let them in. Then he closed the door and the cops all left.

For days the police and deputies searched the woods with a pack of hunting dogs. A helicopter from the National Guard base flew over low and slow, a couple of military men in the bay looking down, searching. Drown teams pushed heavy rakes through the muck pools in the swamp. They dragged the pools near the end of the creek, then the lake below the turnaround. Police checked the bus and train stations, though the boys had never known Eykelboom to

have money that he could have used for travel. Outlying farmers were queried, their barns searched. The local TV anchorman seemed to hint that something had been wrong among the Eykelbooms. But no one ever reported, *It is said that Eykelboom's old man regularly beat the holy shit out of him.*

Among themselves, the boys knew that was why, idiots. Weeks passed like time under water. Winter came and went, then spring. The Eykelbooms, Mr. and Mrs., moved away. Their house sold within a month. This time it was bought by an old man who had worked at the creosote plant. Newly retired, the boys' parents said. Occasionally the retired man's grandson came to see him and spend the day. He was a shy boy, but nice enough, with a small face and downy blond hair. But his grandfather wouldn't let him play with the boys. When they approached, the grandfather came out and gave them a dark glare and called his grandson back in the house.

Wayne went off. He didn't move away, or disappear like Eykelboom, but he stopped hanging out with the boys. They rarely saw him. The oldest McGowen brother had become interested in other things, as well, and pretended the younger two did not exist.

The boys effectively disbanded, a tacit dissolution. They abandoned their forts. It was said that Chandler now kept wild dogs in the woods and fed them deer he shot from his back porch and dragged to a clearing below his house. Then, one late summer night, the woods burned, flames leaping up to the low evening clouds and turning them red and orange. Forest crews managed to contain the fire, but the woods were destroyed, their ruins like a blasted, ghosted battlefield, stumps and blackened fallen trunks releasing swirls of smoke into winter. Spring seedlings worked their way from the dirt, but before they could begin to grow a man in a backhoe churned through the mud and dug a long trench from the lake to the swamp, draining it. Another crew laid a large concrete pipe and installed storm drains on what looked like concrete chimneys emerging from the pipe. Then they covered the pipe with dirt. A grader smoothed and levelled the land. The developer had been waiting, knowing that Chandler would sell. During all this, a policeman kept watch, in case there were



"You were right—I do feel more productive standing."

• •

human remains. There were no remains. No one would ever know what became of Eykelboom. If he was alive somewhere, the boys felt sure that no one knew who he really was. They believed he had made some kind of miraculous escape. Into some other life that he had made up and now occupied, somewhere else. He had passed himself off as older, used his out-sized body to get a job in construction, a factory, an oil field. He rarely spoke to anyone, no more than was absolutely necessary. He was a mystery to everyone who knew him now, wherever he might be.

They all grew older, in the visible world, scattered carelessly into this life or that. The boys' parents sifted into their private, forgotten histories, crumbs of memory in a landscape of stained tablecloths and kitchen floors.

The two younger McGowen brothers, having survived their older brother as well as their parents, had become drinkers, and

sometimes when they were together, drinking and talking, the middle brother would mention Eykelboom. Together, over time, they dismissed the old theory of escape and began to envision Eykelboom deep down in what used to be the swamp. They imagined that the sinkholes there were deeper than anyone had ever known. In spite of the elaborate drainage system the developer installed, the area where the swamp had been was never developed. It had never stabilized.

The brothers imagined Eykelboom there, preserved and whole, curled up in a cold, fluid clay, drifting very slowly with the earth itself. His fists lay knotted against his cheeks, his knees to his chest, his face closed tight in an infinite, chilled gestation. ♦

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Brad Watson on "Eykelboom."

THE CRITICS



THE CURRENT CINEMA

NO LAUGHING MATTERS

"Rosewater" and "Happy Valley."

BY DAVID DENBY

Early in "Rosewater," Jon Stewart's first film as a feature director, an Iranian-born journalist, Maziar Bahari (Gael García Bernal), has a brief meeting in a Tehran café with a comedian (Jason Jones, from "The Daily Show"), who "interviews" him for an American TV program. It is 2009, at the time of the Presidential race between the ultra-conservative incumbent, Mahmoud Ahmadinejad, and the liberal reformer Mir-Hossein Mousavi. The comedian, grinning, pretends to be a spy and asks Bahari why Iran is such a terrifying place; Bahari, who is based in London and is a contributor to the BBC and *Newsweek*, laughs and doesn't answer. The Iranian secret police, however, operate with an undernourished capacity for comedy; they see the interview and put Bahari in prison, where he remains for a hundred and eighteen days, largely isolated except for excruciating sessions with a "specialist." In the movie, no mention is made of "The Daily Show," but the episode is a reference to a mock conversation between Jones and the real Bahari that was broadcast on the program in 2009. Jon Stewart has said that he feels partly responsible for Bahari's troubles, and that the movie is an attempt at "atonement." It also comes across as a satirist's impassioned bid to promote global sanity. In "Rosewater," Stewart suggests that a government that will not tolerate humor is capable of the worst tyrannies.

In the film's early scenes, as the election nears, Bahari, warily hoisting a digital movie camera, hangs out with some

genial students who support Mousavi. You can sense that Stewart is trying to find his way: as Bahari gets caught up in protests and police reprisals, Stewart, working with a small crew (the film was shot in Amman), produces scrappy sequences with loosely fitted-together shots and dialogue that's a little clunky and overexplicit, even didactic. This part of the film lacks ease and mystery—what might be called authority. Stewart chose the great Iranian actress Shohreh Aghdashloo to play Bahari's mother, but, with her tragic face and her magnificent contralto voice, she plays a tiny role as if she were in an amphitheatre.

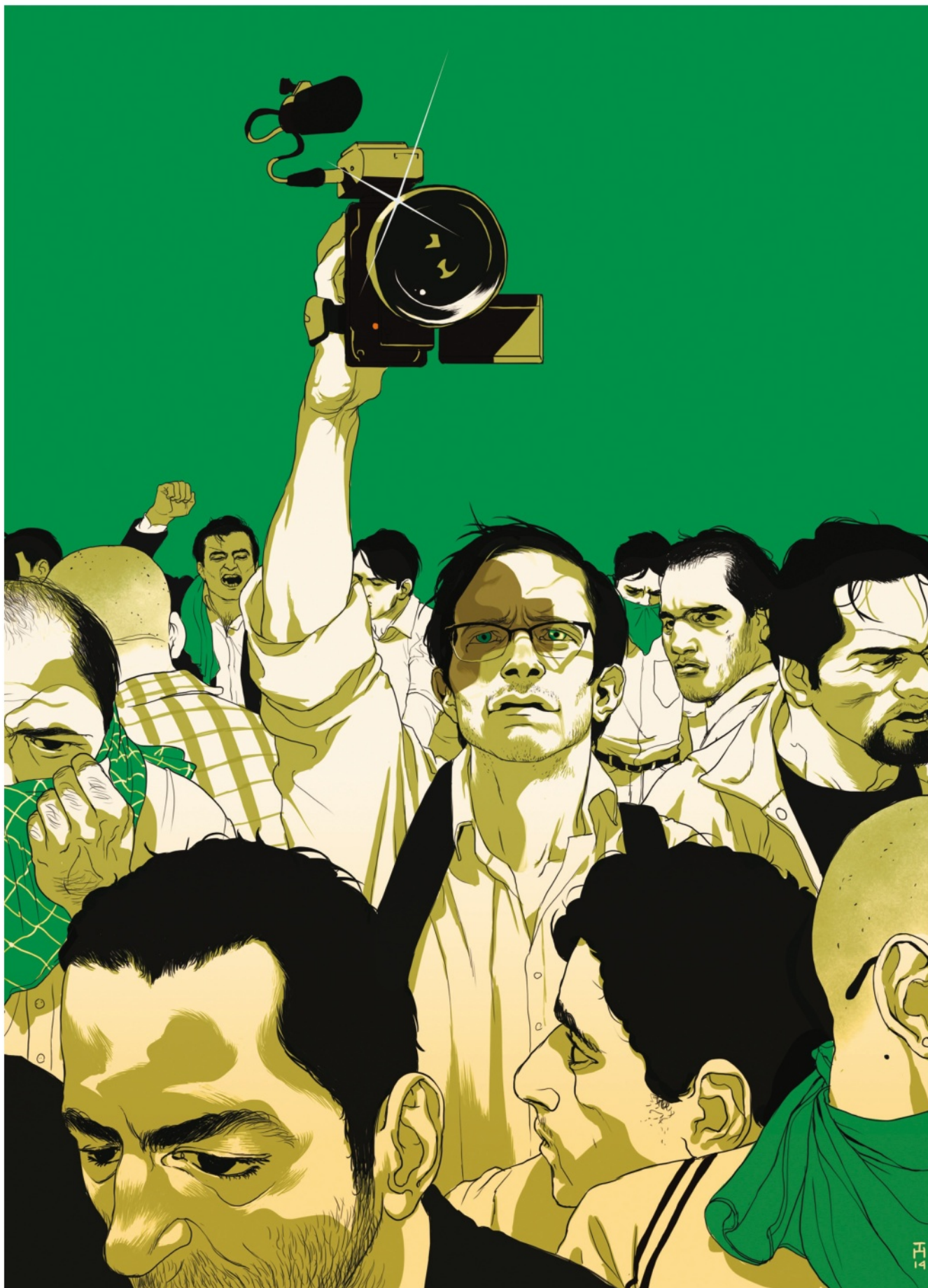
Once Bahari is in prison, however, "Rosewater" comes to creative life. Some of the cells, painted gray and white, are oddly shaped; one appears to be an irregular triangle. Bahari seems caught in a contemporary art installation. The hard-focus clarity of the images (Bobby Bukowski did the cinematography) leads to an intimacy with anguish that passes into expressionism. As Bahari sits in a chair, wearing a black blindfold, his interrogator (Kim Bodnia), whom he calls Rosewater (the man is heavily scented), lingers over his neck as if he's about to kiss it—or bite it. Stewart shot the two actors in a tight frame, Bodnia smiling and pleased with his ongoing project and García Bernal sweating and trembling. The peculiar communion of torturer and victim has never been dramatized with such creepy immediacy. The two are matched opposites: Bahari is a modest, good-humored guy who hopes that a little common sense will re-

store reality to the situation; Rosewater is a thug who longs to be sophisticated (*klass bala*, in Farsi). He wants to become an interrogator who's subtle in his manipulations, one who resorts to violence only occasionally. But his suavity collapses, and he beats Bahari; García Bernal is so delicate that the scene is more painful to watch than such scenes usually are. Rosewater is also fascinated by what he imagines to be Bahari's wild sexual adventures as a spy. "You know what happens in New Jersey," Bahari says, leading him on. "Yes, of course, everyone knows what happens in New Jersey," Rosewater responds, excited by the sexual possibilities of Fort Lee. In these moments, Stewart transcends skit satire and pushes to the borders of the comic sinister, where Kafka and Nabokov live.

Confession and penance are central to totalitarian regimes: the dissenter must admit to crimes that he didn't commit or rectify any discordant remarks he has made so that they're in line with the "truth"—in this case, the unitary discourse offered by holy texts and propounded by the Supreme Leader. By definition, irony is impossible; speech can have only one state-defined meaning. A man who talks to someone who is speaking the language of a "spy" must be a spy himself. Why else would he be speaking that way? In all, theocrats make bad comics and a lousy audience for comedy. Bahari tells Rosewater that *Newsweek* is so far behind the times that he's not worth torturing. The tormentor doesn't get that one, either.

In "Happy Valley," Amir Bar-Lev's mesmerizing documentary about the sexual-abuse scandal at Pennsylvania State University, the director returns several times to an interview with a student in his senior year. The young man wears a Penn State T-shirt and cap, turned backward on his head, and sits on a bed in his dorm room, with a picture of Joe Paterno, the legendary Penn State football coach, on a wall behind him. At the time of the interview, Jerry Sandusky, who was Paterno's assistant football coach from 1969 to 1999, had been convicted of forty-five counts of sexually abusing children, and Paterno had been fired for repeatedly looking the other way when reports reached

ABOVE: LEANDRO CASTELAO



Gael García Bernal plays Maziar Bahari, a journalist who was imprisoned in Iran, in a film directed by Jon Stewart.

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him of Sandusky's activities. Some of the victims had come forward with painful stories, including Sandusky's adopted son Matt, whose account of his father's endearments and aggressions closely matched the others'. The town, State College, and the university community were in anguish, yet the student in the interview is irked by the public displays of guilt and redemption—such as a candlelight vigil for the victims held in place of the usual Friday-night pre-game pep rally and an extended prayer session on the playing field before the game on Saturday. At first, the student's role is puzzling. Bar-Lev's movie is a reconstruction of the scandal and its aftermath, with interviews, news reports, and footage of Penn State games. He doesn't provide a narration, but his increasingly powerful arrangement of the material forces a moral and spiritual reckoning with the events. Why is this student given such prominence? By the end, we know: his impatience represents America's sports obsession at its most insensitive.

Bar-Lev arrived on Penn State's University Park campus (Happy Valley is its nickname) as Sandusky's trial was reaching its conclusion. He captures the special spirit of the place, an aura of enthrallment to football with some strange religious overtones. A mural by the artist Michael Pilato covers the side of a block-long building downtown: Paterno, seated at the center, is God, and Sandusky, on his right, is Christlike; ranks of prominent townspeople, winged angels, and Penn State athletes—almost all of whom are white, although many of the team members are black—are arrayed around and above them in ranks. As many people in State College tell Bar-Lev, Paterno was a father figure not just to his players but to the entire community—the provider of good times in a series of beloved and sanctified football rituals. He made them feel both celebrated and safe.

Matt Sandusky, who is now married and the father of four children, is interviewed at length. He speaks evenly and slowly, with considerable strength, but the light in his eyes, visible in pictures of him as a child, has died. He describes how Sandusky rescued him from poverty, taking him first into the Second Mile, which Sandusky founded, initially,

as a group foster home for underprivileged boys, and then into his home. Loyalty and gratitude, Matt says, enforced his silence for decades. Benevolence shades into control. Paterno helped teenagers by giving them a chance to play football at Penn State; Sandusky, shielded by Paterno's reputation, seemed to be helping to prepare younger boys for a better future at the Second Mile, but quietly "culled" them for sexual abuse. In the town's eyes, however, the two men were linked in an image of inspirational kindness.

As the movie presses ahead, through interviews and reflections (Andrew Shubin, a lawyer who represented some of the victims at Sandusky's trial, is particularly cogent), the awful perversity of the situation morphs into a general malaise. When the N.C.A.A. severely sanctioned Penn State, in 2012, it cited "a culture of reverence for the football program that is ingrained at all levels of the campus community." Bar-Lev shoots an extraordinary sequence in which a feisty old man in a Penn State cap takes up a post outside the football stadium by a statue of Paterno; it is a much visited totem, and the man holds up a handwritten sign that condemns "pedophile-enablers." People walking by—some of whom have travelled miles to see the statue—curse him, shove him, and tear up his sign. He turns out to be a literal iconoclast: the university removed the statue sometime after this event.

Paterno had weaknesses—a reluctance to face unpleasant facts and an indifference to the victims' suffering—which are mirrored and amplified, as Bar-Lev records, in the town's denial of Paterno's fallibility. At the end of the movie, Paterno and Sandusky are gone, and State College recovers and becomes enthralled once more. The camera glides above and behind an enormous player, in slow motion, as awestruck fans reach out to touch him. Paradise lost, paradise regained. "Happy Valley" is a devastating portrait of a community—and, by extension, a nation—put under a spell, even reduced to grateful infantilism, by the game of football. ♦

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Richard Brody blogs about movies.



BOOKS

DROOL

Ivan Pavlov's real quest.

BY MICHAEL SPECTER



Pavlov (operating on a dog in 1902) ran his lab like a factory; dogs were his machines.

As a college student, B. F. Skinner gave little thought to psychology. He had hoped to become a novelist, and majored in English. Then, in 1927, when he was twenty-three, he read an essay by H. G. Wells about the Russian physiologist Ivan Pavlov. The piece, which appeared in the *Times Magazine*, was ostensibly a review of the English translation of Pavlov's "Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex." But, as Wells pointed out, it was "not an easy book to read," and he didn't spend much time on it. Instead, Wells described Pavlov, whose systematic approach to physiology had revolutionized the study of medicine, as "a star which lights the world, shining down a vista hitherto unexplored."

That unexplored world was the mechanics of the human brain. Pavlov had noticed, in his research on the digestive system of dogs, that they drooled as soon as they saw the white lab coats of the people who fed them. They didn't need to see, let alone taste, the food in

order to react physically. Dogs naturally drooled when fed: that was, in Pavlov's terms, an "unconditional" reflex. When they drooled in response to a sight or sound that was associated with food by mere happenstance, a "conditional reflex" (to a "conditional stimulus") had been created. Pavlov had formulated a basic psychological principle—one that also applied to human beings—and discovered an objective way to measure how it worked.

Skinner was enthralled. Two years after reading the *Times Magazine* piece, he attended a lecture that Pavlov delivered at Harvard and obtained a signed picture, which adorned his office wall for the rest of his life. Skinner and other behaviorists often spoke of their debt to Pavlov, particularly to his view that free will was an illusion, and that the study of human behavior could be reduced to the analysis of observable, quantifiable events and actions.

But Pavlov never held such views, according to "Ivan Pavlov: A Russian Life in Science" (Oxford), an exhaustive new

biography by Daniel P. Todes, a professor of the history of medicine at Johns Hopkins School of Medicine. In fact, much of what we thought we knew about Pavlov has been based on bad translations and basic misconceptions. That begins with the popular image of a dog salivating at the ringing of a bell. Pavlov "never trained a dog to salivate to the sound of a bell," Todes writes. "Indeed, the iconic bell would have proven totally useless to his real goal, which required precise control over the quality and duration of stimuli (he most frequently employed a metronome, a harmonium, a buzzer, and electric shock)."

Pavlov is perhaps best known for introducing the idea of the conditioned reflex, although Todes notes that he never used that term. It was a bad translation of the Russian *uslovnyi*, or "conditional," reflex. For Pavlov, the emphasis fell on the contingent, provisional nature of the association—which enlisted other reflexes he believed to be natural and unvarying. Drawing upon the brain science of the day, Pavlov understood conditional reflexes to involve a connection between a point in the brain's subcortex, which supported instincts, and a point in its cortex, where associations were built. Such conjectures about brain circuitry were anathema to the behaviorists, who were inclined to view the mind as a black box. Nothing mattered, in their view, that could not be observed and measured. Pavlov never subscribed to that theory, or shared their disregard for subjective experience. He considered human psychology to be "one of the last secrets of life," and hoped that rigorous scientific inquiry could illuminate "the mechanism and vital meaning of that which most occupied Man—our consciousness and its torments." Of course, the inquiry had to start somewhere. Pavlov believed that it started with data, and he found that data in the saliva of dogs.

Pavlov's research originally had little to do with psychology; it focussed on the ways in which eating excited salivary, gastric, and pancreatic secretions. To do that, he developed a system of "sham" feeding. Pavlov would remove a dog's esophagus and create an opening, a fistula, in the animal's throat, so that, no matter how much the dog ate, the food would fall out and never make it to

the stomach. By creating additional fistulas along the digestive system and collecting the various secretions, he could measure their quantity and chemical properties in great detail. That research won him the 1904 Nobel Prize in Physiology or Medicine. But a dog's drool turned out to be even more meaningful than he had first imagined: it pointed to a new way to study the mind, learning, and human behavior.

"Essentially, only one thing in life is of real interest to us—our psychical experience," he said in his Nobel address. "Its mechanism, however, was and still is shrouded in profound obscurity. All human resources—art, religion, literature, philosophy, and the historical sciences—all have joined in the attempt to throw light upon this darkness. But humanity has at its disposal yet another powerful resource—natural science with its strict objective methods."

Pavlov had become a spokesman for the scientific method, but he was not averse to generalizing from his results. "That which I see in dogs," he told a journalist, "I immediately transfer to myself, since, you know, the basics are identical."

Ivan Pavlov was born in 1849 in the provincial Russian city of Ryazan, the first of ten children. As the son of a priest, he attended church schools and the theological seminary. But he strug-

gled with religion from an early age and, in 1869, left the seminary to study physiology and chemistry at St. Petersburg University. His father was furious, but Pavlov was undeterred. He never felt comfortable with his parents—or, as this biography makes clear, with almost anyone else. Not long after "The Brothers Karamazov" was published, Pavlov confessed to his future wife, Seraphima Vasilievna Karchevskaya, who was a friend of Dostoyevsky's, that he identified with the rationalist Ivan Karamazov, whose brutal skepticism condemned him, as Todes notes, to nihilism and breakdown. "The more I read, the more uneasy my heart became," Pavlov wrote in a letter to Karchevskaya. "Say what you will, but he bears a great resemblance to your tender and loving admirer."

Pavlov entered the intellectual world of St. Petersburg at an ideal moment for a man eager to explore the rules that govern the material world. The tsar had freed the serfs in 1861, helping to push Russia into the convulsive century that followed. Darwin's theory of evolution was starting to reverberate across Europe. Science began to matter in Russia in a way it hadn't before. At the university, Pavlov's freshman class in inorganic chemistry was taught by Dmitri Mendeleev, who, a year earlier, had created the periodic table of the elements as a teaching tool. The Soviets would

soon assign religion to the dustbin of history, but Pavlov got there ahead of them. For him, there was no religion except the truth. "It is for me a kind of God, before whom I reveal everything, before whom I discard wretched worldly vanity," he wrote. "I always think to base my virtue, my pride, upon the attempt, the wish for *truth*, even if I cannot attain it." One day, while walking to his lab at the Institute for Experimental Medicine, Pavlov watched with amazement as a medical student stopped in front of a church and crossed himself. "Think about it!" Pavlov told his colleagues. "A naturalist, a physician, but he prays like an old woman in an almshouse!"

Pavlov was not a pleasant person. Todes presents him as a volatile child, a difficult student, and, frequently, a nasty adult. For decades, his lab staff knew to stay away, if at all possible, on his "angry days," and there were many. As a member of the liberal intelligentsia, he was opposed to restrictive measures aimed at Jews, but in his personal life he freely voiced anti-Semitic sentiments. Pavlov once referred to "that vile yid, Trotsky," and, when complaining about the Bolsheviks in 1928, he told W. Horsley Gantt, an American scientist who spent years in his lab, that Jews occupied "high positions everywhere," and that it was "a shame that the Russians cannot be rulers of their own land."

In lectures, Pavlov insisted that medicine had to be grounded in science, on data that could be explained, verified, and analyzed, and on studies that could be repeated. Drumming up support among physicians for the scientific method may seem banal today, but at the end of the nineteenth century it wasn't an easy sell. In Russia, and even to some degree in the West, physiology was still considered a "theoretical science," and the connection between basic research and medical treatments seemed tenuous. Todes argues that Pavlov's devotion to repeated experimentation was bolstered by the model of the factory, which had special significance in a belatedly industrializing Russia. Pavlov's lab was essentially a physiology factory, and the dogs were his machines.

To study them, he introduced a rigorous experimental approach that



"This conversation may be recorded for training purposes and used in a hilarious mix for our annual office party."

helped transform medical research. He recognized that meaningful changes in physiology could be assessed only over time. Rather than experiment on an animal once and then kill it, as was common, Pavlov needed to keep his dogs alive. He referred to these studies as “chronic experiments.” They typically involved surgery. “During chronic experiments, when the animal, having recovered from its operation, is under lengthy observation, the dog is irreplaceable,” he noted in 1893.

The dogs may have been irreplaceable, but their treatment would undoubtedly cause an outcry today. Todes writes that in early experiments Pavlov was constantly stymied by the difficulty of keeping his subjects alive after operating on them. One particularly productive dog had evidently set a record by producing active pancreatic juice for ten days before dying. The loss was a tremendous disappointment to Pavlov. “Our passionate desire to extend experimental trials on such a rare animal was foiled by its death as a result of extended starvation and a series of wounds,” Pavlov wrote at the time. As a result, “the expected resolution of many important and controversial questions” had been delayed, awaiting another champion test subject.

If Pavlov’s notes were voluminous, Todes’s own investigations are hardly modest. He spent years researching this biography and has made excellent use of archives in Russia, Europe, and the United States. No scholar of Pavlov or of the disciplines he inspired will be able to ignore this achievement. The book’s eight hundred and fifty-five pages are filled with a vast accumulation of data, although the reader might have been better served if Todes had left some of it out. No minutia appears to have been too obscure to include. Here is Todes describing data that Pavlov had assembled from one extended experiment: “The total amount of secretion in trials 6 and 8 is too low, and the slope of these curves diverges markedly at several points from that in trial 1. Trial 9 fits trial 1 more snugly than does trial 5 in terms of total secretion, but the amount of secretion more than doubles in the second hour, contrasting sharply with the slight decline in trial 1. Trial 10 is again a good fit in terms of total amount of secretion, but

the amount of secretion rises inappropriately in the fourth hour.” The diligent reader can also learn, in excruciating detail, what time Pavlov took each meal during summer holidays (dinner at precisely 12:30 P.M., tea at four, and supper at eight), how many cups of tea he typically consumed each afternoon (between six and ten), and where the roses were planted in his garden (“around the spruce tree on the west side of the veranda”). It’s hard not to wish that Todes had been a bit less devoted to his subject’s prodigious empiricism.

For more than thirty years, Pavlov’s physiology factory turned out papers, new research techniques, and, of course, gastric juice—a lot of it. On a good day, a hungry dog could produce a thousand cubic centimetres, more than a quart. Although this was a sideline for Pavlov, the gastric fluids of a dog became a popular treatment for dyspepsia, and not just in Russia. A “gastric juice factory” was set up for the purpose. “An assistant was hired and paid thirty rubles a month to oversee the facility,” Todes writes. “Five large young dogs, weighing sixty to seventy pounds and selected for their voracious appetites, stood on a long table harnessed to the wooden cross-beam directly above their heads. Each was equipped with an esophagotomy and fistula from which a tube led to the collection vessel. Each ‘factory dog’ faced a short wooden stand tilted to display a large bowl of minced meat.” By 1904, the venture was selling more than three thousand flagons of gastric juice annually, Todes writes, and the profits helped increase the lab budget by about seventy per cent. The money was helpful. So was the apparent demonstration that a product created in an experimental laboratory could become useful to doctors all over the world.

At the turn of the century, Pavlov had begun focussing his research on “psychic secretions”: drool produced by anything other than direct exposure to food. He spent most of the next three decades exploring the ways conditional reflexes could be created, refined, and extinguished. Before feeding a dog, Pavlov might set a metronome at, say, sixty beats a minute. The next time the dog heard a metronome at any speed, it would salivate. But when only that particular metronome setting was reinforced



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with food the dog became more discriminating. Pavlov deduced that there were colliding forces of “excitation” and “inhibition” at play—so that, at first, the stimulus spreads across the cerebral cortex and then, in the second phase, it concentrates at one specific spot.

As his formulations and models grew more complex, Pavlov was encouraged in his hope that he would be able to approach psychology through physiology. “It would be stupid to reject the subjective world,” he remarked later. “Our actions, all forms of social and personal life are formed on this basis. . . . The question is how to analyze this subjective world.”

Pavlov was sixty-eight and had been famous for years when Lenin came to power, and Todes is at his best in describing the scientist’s relationship with the regime that he would serve for the rest of his life. Pavlov harbored no sentimental attachment to the old order, which had never been aggressive in funding scientific research. The Bolsheviks promised to do better (and, eventually, they did). Yet Pavlov considered Communism a “doomed” experiment that had turned Russia back into a nation of serfs. “Of course, in the struggle between labor and capital the government must stand for the protection of the worker,” he said in a speech. “But what have we made of this? . . . That which constitutes the culture, the intellectual strength of the nation, has been devalued, and that which for now remains a crude force, replaceable by a machine, has been moved to the forefront. All this, of course, is doomed to destruction as a blind rejection of reality.”

Lenin had too many other problems to spend his time worrying about one angry scientist. At first, Pavlov, his wife, and their four children were treated like any other Soviet citizens. Their Nobel Prize money was confiscated as property of the state. From 1917 to 1920, like most residents of Petrograd, which would soon be called Leningrad, the Pavlovs struggled to feed themselves and to keep from freezing. It was nearly a full-time occupation; at least a third of Pavlov’s colleagues at the Russian Academy of Sciences died in those first post-revolutionary years. “Some starved

to death in apartments just above or below his own in the Academy’s residence,” Todes writes. Pavlov grew potatoes and other vegetables right outside his lab, and when he was sick a colleague provided small amounts of firewood to burn at home.

In 1920, Pavlov wrote to Lenin’s secretary, Vladimir Bonch-Bruевич, seeking permission to emigrate, although, as Todes points out, it was probably not yet necessary to ask. Pavlov wanted to see if, as he suspected, universities in Europe or America would fund his research in circumstances that would prevent his dogs and lab workers from starving. Bonch-Bruевич turned the letter over to Lenin, who immediately grasped the public-relations repercussions of losing the country’s most celebrated scientist. He instructed Petrograd Party leaders to increase rations for Pavlov and his family, and to make sure his working conditions improved.

The Soviets came to regard Pavlov as a scientific version of Marx. The comparison could not entirely have pleased Pavlov, who rebelled at the “divine” authority accorded Marx (“that fool”) and denied that his own “approach represents pure materialism.” Indeed, where others thought that the notion of free will would come to be discarded once we had a full understanding of how the mind worked, Pavlov was, at least at times, inclined to think the opposite. “We would have freedom of the will in proportion to our knowledge of the brain,” he told Gantt in 1927, just as “we had passed from a position of slave to a lord of nature.”

That year, Stalin began a purge of intellectuals. Pavlov was outraged. At a time when looking at the wrong person in the wrong way was enough to send a man to the gulag, he wrote to Stalin saying that he was “ashamed to be called a Russian.” Nikolai Bukharin, who considered Pavlov indispensable, made the case for him: “I know that he does not sing the ‘Internationale,’” Bukharin wrote to Valerian Kuibyshev, the head of the state planning committee. “But . . . despite all his grumbling, *ideologically* (in his works, not in his speeches) he is working for us.”

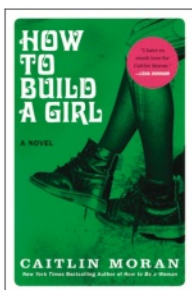
Stalin agreed. Pavlov prospered even at the height of the Terror. By 1935–36, he was running three separate laborato-

ries and overseeing the work of hundreds of scientists and technicians. He was permitted to collaborate with scholars in Europe and America. Still, his relationship with the government was never easy. Soviet leaders even engaged in a debate over whether to celebrate his eightieth birthday. “A new nonsensical letter from academician Pavlov,” Molotov wrote in the margin of a letter of complaint before it was passed to Stalin. Kuibyshev was deeply opposed to any state recognition. “Pavlov spits on the Soviets, declares himself an open enemy, yet Soviet power would for some reason honor him,” he grumbled. “Help him we must,” he said at the time, “but not honor him.” For a while, Kuibyshev prevailed, but in 1936, when Pavlov died, at eighty-six, a hundred thousand mourners, including Party officials, filed past his casket as he lay in state.

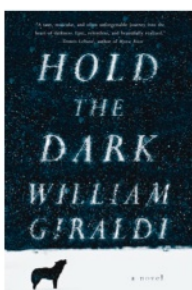
What Todes describes as Pavlov’s “grand quest”—to rely on saliva drops and carefully calibrated experiments to understand the mechanics of human psychology—lives on, in various forms. Classical conditioning remains a critical tool: it is widely used to treat psychiatric disorders, particularly phobias. But the greater pursuit is for a kind of unified field theory in which psychology and physiology—the subjective and the material realms—would finally be integrated.

And so we have entered the age of the brain. The United States and other countries have embarked upon brain-mapping initiatives, and Pavlov would have endorsed their principal goal: to create a dynamic picture of the brain that demonstrates, at the cellular level, how neural circuits interact. As Todes points out, while Pavlov examined saliva in his attempts to understand human psychology, today we use fMRIs in our heightened search for the function of every neuron. When he delivered his lectures on the “larger hemispheres of the brain,” Pavlov declared, “We will hope and patiently await the time when a precise and complete knowledge of our highest organ, the brain, will become our profound achievement and the main foundation of a durable human happiness.” We are still waiting, but less patiently than before. ♦

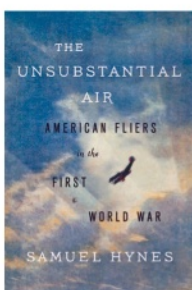
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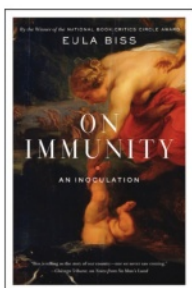
HOW TO BUILD A GIRL, by *Caitlin Moran* (Harper). This coming-of-age novel by the author of the best-selling memoir “How to Be a Woman” follows Johanna Morrigan, a teen-ager who dramatically reinvents herself in order to escape a drab upbringing in the English Midlands and various other mortifications. Adopting a new name, Dolly Wilde, she proclaims herself a music critic, rapidly loses her virginity, and establishes herself as a Mad Dog-sipping, sexually adventurous London writer known for eviscerating bands. Moran resists drawing easy lessons, and is content to keep her heroine messy. The earnestness with which Johanna goes about constructing a new persona gives the novel an almost irresistible verve, and the reader continues to root for her even during the most embarrassing episodes.



HOLD THE DARK, by *William Giraldi* (Liveright). In this eerie novel, set in a remote, icy village in Alaska, a haunted former nature writer named Russell Core is summoned to hunt a wolf that has apparently snatched a six-year-old boy, and retrieve the boy's bones. Core begins his task only to discover the boy's body frozen in a root cellar. The boy's father returns from fighting in an unspecified war and embarks on a bloody campaign of vengeance. Giraldi's unrelenting, perfectly paced prose whips the book along to an unnerving conclusion. By the end, we feel, as Core does, “that man belongs neither in civilization nor nature—because we are aberrations between two states of being.”



THE UNSUBSTANTIAL AIR, by *Samuel Hynes* (Farrar, Straus & Giroux). This history of American airmen in the First World War conveys the fervor with which young men rushed to take part in a new form of combat. Many of them were acquainted thanks to boarding schools or the Ivy League, and illusions of glory lingered among the corps, even as pilots crashed carrying out ill-defined missions in untested machines and without parachutes. Hynes relies on contemporary letters and diaries, a choice that leaves the strategic import of the air war hazy but captures the flyers' perspective and the racy, exhilarating experience of flight. One pilot wrote, “Our squadron is just a mob without a system or method in the air.”



ON IMMUNITY, by *Eula Biss* (Graywolf). This absorbing essay about contemporary ideas of public health takes the form of an attempt to understand the anti-vaccine movement, and draws on subjects as varied as “Silent Spring,” Dracula, “Illness as Metaphor,” and C.I.A. vaccination campaigns in Pakistan. Biss, whose previous book was a fierce and virtuosic meditation on race in America, treads more gently here, grounding her views in her experience as a new mother amid a babble of data and hearsay. She suspects that mothers who seem defensive and superstitious about their children's health developed such attitudes because, until quite recently, even schizophrenia and homosexuality were thought to be caused by poor mothering. Biss pushes back against the polarities of inoculation debates, focussing instead on a collective vision—herd immunity as “shared space.”

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LATE BLOOM

Hermione Lee's biography of the writer Penelope Fitzgerald.

BY JAMES WOOD



A very definite place.” So Penelope Fitzgerald described the English town of Southwold, on the Suffolk coast—a place of wet winds, speeding clouds, and withdrawn beauty where she and her family moved in 1957, when she was forty-one. It is a characteristic phrase, from a writer of a very definite prose, with sharp outlines and a distinctly high-handed economy. Modern literature is mostly written not by aristocrats but by the middle classes. A certain class confidence, not to say imperiousness, can be heard in well-born writers like Nabokov and Henry Green; Tolstoy’s famous line about Ivan Ilyich—“Ivan Ilyich’s life had been most simple and most ordinary,

and therefore most terrible”—represents surely a count’s hauteur as much as a religious moralist’s lament. Fitzgerald was not exactly an aristocrat (her forebears were scholars and intellectuals), or exactly gentry (they were religiously wary of money and possessions), but she came from a brilliant and eminent family, with long connections to both the Church of England and Oxford University, and the tone of command is everywhere in her writing.

Authority is part of the obscure magic of her achievement as a novelist. If one of the commonest critical responses to her work seems to be laudatory bafflement—“How does she do it?”—the be-

ginning of an answer is that she proceeds with utmost confidence that she will be heard and that we will listen, even to her reticence. Her fictions sit on the page with the well-rubbed assurance of fact, as if their details were calmly agreed upon, and long established. And though you might expect work of irritating certitude, Fitzgerald’s confidence in her material is oddly disarming; she seems somehow to take life as it comes, as if we were always entering her novels in the middle of how things just are. This is the opening of “The Bookshop” (1978):

In 1959 Florence Green occasionally passed a night when she was not absolutely sure whether she had slept or not. This was because of her worries as to whether to purchase a small property, the Old House, with its own warehouse on the foreshore, and to open the only bookshop in Hardborough. The uncertainty probably kept her awake. She had once seen a heron flying across the estuary and trying, while it was on the wing, to swallow an eel which it had caught. The eel, in turn, was struggling to escape from the gullet of the heron and appeared a quarter, a half, or occasionally three-quarters of the way out. The indecision expressed by both creatures was pitiable. They had taken on too much. Florence felt that if she hadn’t slept at all—and people often say this when they mean nothing of the kind—she must have been kept awake by thinking of the heron.

“The Bookshop,” published when Fitzgerald was sixty-one, announced her arrival on the literary scene, and the qualities of her immense vitality are all present at the beginning of her late-blooming career. The passage is lively in part because its music is jagged: each sentence is a little different from its predecessor; nothing is quite allowed to settle into the familiar. Precision seems important (“1959”; “a quarter, a half, or occasionally three-quarters”), but the novelist’s certainty does not preclude a tactful hesitancy about her characters (“The uncertainty probably kept her awake”). At the very moment the reader might expect pathos or sentiment, there is a quizzical resistance to it (heron and eel are pitiable only in their “indecision”). The writing quietly hovers around the thoughts of its protagonist (heron and eel “had taken on too much,” like Florence Green) but has room for authorial impatience (“and people often say this when they mean nothing of the kind”).

At first, it all sounds recognizably

Fitzgerald seemed set for early success, and yet published her first novel in her sixties.

English: peppery, proprietorial, curiously angled, like Evelyn Waugh and Muriel Spark (both influences, to an extent). Fitzgerald is frequently funny, never more so than in her first novel. A young Member of Parliament is paradoxically compacted into “a brilliant, successful, and stupid young man.” A ten-year-old girl, Christine Gipping, who comes to help out in Florence Green’s doomed bookshop, is described as using her “best” (i.e., most educated-sounding) voice, “the one urged by her class teacher on those who had to play Florence Nightingale, or the Virgin Mary.” Piles of neglected novels have the air, “in their slightly worn jackets, of women on whom no one had ever made any demand.” An entire community is summarized thus: “Later middle age, for the upper middle-class in East Suffolk, marked a crisis, after which the majority became water-colourists, and painted landscapes. It would not have mattered so much if they had painted badly, but they all did it quite well.” Yet this witty passage continues into a different, larger atmosphere, and we sense that Fitzgerald will not be content to move merely in Waugh’s wake: “All their pictures looked much the same. Framed, they hung in sitting-rooms, while outside the windows the empty, washed-out, unarranged landscape stretched away to the transparent sky.”

For every sentence of exacting satire in her work, there is another of lyrical enigma or amplitude. Details that seem expertly factual quickly become dreamily resonant. In “The Beginning of Spring” (1988), a meticulous, finely practical description of a Russian dacha and its storerooms (“In front of the dacha, running across its whole length, was a veranda of shaky wooden planks, with a roof supported by fretwork columns”) suddenly glints with hidden treasure. Underneath that veranda, Fitzgerald writes, if you lifted one of the loose planks, there was a good deal of rustling animal and vegetable life. And also this: “Some previous tenant (the whole estate, the forest, the village and the dacha, was owned by a Prince Demidov, who preferred to live in Le Touquet) had left his knives and forks there for safety during the winter, and had forgotten them, or perhaps had

never returned.” In “The Gate of Angels” (1990), Fred Fairly returns to the village of Blow, where his parents and siblings live. It is 1907, and all is English pastoral. The flowers that throng the village are catalogued (“early roses red and white, pot marigolds, feverfew which was grown here as a garden plant, ferocious poppies and cornflowers,” and so on), and we are told that even at the train station people are growing roses and beans, “and large marrows striped like a tom-cat.” And then Fitzgerald pauses to notice, at the station, a “very young porter,” who is “lining up the milk-churns,” and the information begins to sing: “A certain amount of milk always got spilled on the platform, giving it a faint smell of a nursery sink, drowned at the moment by the bean-flowers and the meadowsweet.”

In the same way, a prose that wryly announces comedy can, in the next sentence, wryly announce tragedy. The passage that opens “The Bookshop”—tart but cozy, we think, something we can deliciously settle into—gives way, in the succeeding paragraph, to something much less easy: “For more than eight years of half a lifetime she had lived at Hardborough on the very small amount of money her late husband had left her and had recently come to wonder whether she hadn’t a duty to make it clear to herself, and possibly to others, that she existed in her own right.” The novel, like most of Fitzgerald’s stories, is about tragicomic failure: the book ends with Florence Green leaving the town by train, thwarted by a vengeful and parochial community, the dream of her shop in disarray, bowing her head in shame, “because the town in which she had lived for nearly ten years had not wanted a bookshop.”

Like her prose, Penelope Fitzgerald’s life has front rooms and back rooms: public places where appearances are maintained and a comic, insouciant hospitality holds sway; and obscurer realms, where the cutlery is rusting and milk has been spilled, heads are bowed in shame, and everything is breaking apart. Fitzgerald’s public, literary life looks much like patience on a monument: having brought up three children almost single-handedly, against difficult odds, the author finds her voice late in life, and starts publishing when she

is nearly sixty. Although she mock-modestly referred to her first book, a biography of the artist Edward Burne-Jones she published in 1975, as nothing more than “My Little Bit of Writing,” we know better, because we know that she will go on to publish nine novels in the last twenty years of her life, that one of them, “Offshore” (1979), will win the Booker Prize, and that her final novel, “The Blue Flower” (1995), is indisputably great. We know that after her death, in 2000, she will often be described as one of Britain’s finest postwar writers.

She learned how to wait: success as a late distillation of talent. The private story is much stranger and sadder and more haphazard, as Hermione Lee’s remarkable biography “Penelope Fitzgerald: A Life” (Knopf) reveals. The story that Lee’s book tells (or tries to tell, because much evidence has been obscured or lost) is not about patience on a monument but about talent buried under a heavy plinth, and discovered only just in time—the late achievement less a measured distillation than a life-saving decoction.

Penelope Fitzgerald was bound for success. She was born in 1916 into what Lee calls “a brilliantly clever English family distinguished by alarming honesty, caustic wit, shyness, moral rigour, willpower, oddness, and powerful banked-down feelings, erupting in moments of sentiment or in violent bursts of temper and gloom.” Academic and institutional achievement was taken for granted, so much so that it could be interestingly squandered or subverted. Fitzgerald, in her biography of the most prominent members of this family, “The Knox Brothers” (1977), described her father and his three brothers, each of them novels-in-waiting. One uncle, Dillwyn Knox, was a mathematical genius, a classicist and Fellow of King’s College, Cambridge, who became a cryptographer, and whose work at Bletchley Park, in the Second World War, was instrumental in cracking the Enigma code. But his wartime work was secretive. Outwardly, he seemed to live in shabby eccentricity and with aimless brilliance, in a damp and drafty house not far from Oxford, where he busied himself in studying Greek

poetry and inventing verse forms. He was fiercely agnostic: to him, Christ was “that deluded individual, J.C.”

The lives of the two other uncles, Wilfred and Ronald Knox, bore the impress of the family’s religious imperatives—Penelope’s grandfather had been the Bishop of Manchester. Wilfred, shy and awkward, eventually joined a celibate religious order, and wrote a book, “Meditation and Mental Prayer,” treasured by his niece. Ronald, who learned Latin and Greek at four, and was remembered as “the cleverest boy in Eton’s living memory,” became famous as his generation’s most prominent Anglican convert to Catholicism. He wrote detective stories, did a new translation of the Bible, and became the Catholic chaplain of Oxford University. Evelyn Waugh wrote his biography. Ronald’s niece noticed—in a detail enjoyed by Lee, who is also a talented noticer—that at his home in Oxford a picture hanging upside down in a passage stayed that way for twelve years.

Perhaps the least interesting of the Knox brothers was the one most lightly touched by religious or anti-religious fervor—Penelope Knox’s father, Edmund, who would say that church did not seem to “rub off properly” on him. He left Oxford without a degree, and had a successful career as a satirical journalist, first, as a columnist for the magazine *Punch* and, later, as its editor. But he seems also to have been the Knox most marked by the early death of his mother, when he was eleven, and by the isolation of his schooling. Some thought him cold. Lee writes that “his emotions went underground when she died.” Like his brothers, and like his daughter, he had a talent for what Fitzgerald called “the Edwardian habit of understatement.” The phrase is itself an understatement. Certainly, it is easy to enjoy the glamorous modesty whereby Penelope Fitzgerald referred to “The Blue Flower” as “a novel *of sorts*.” And it is difficult not to laugh when, after losing the houseboat she had been living on for three years between 1960 and 1963 (it started to sink into the Thames, and was towed away), Fitzgerald, only a little harried, arrives at the school where she was teaching, Westminster Tutors, and announces to her students, “I’m sorry I’m late, but my house sank.” This

is of a piece with a wartime story Lee tells of Fitzgerald’s father. As Edmund Knox was opening a bottle of wine, a German bomb fell nearby, and the impact forced the cork out of the neck. “If one could rely on its happening regularly” was Edmund’s suavely murmured response.

But this fine calm is merely the idealized official version of a helpless silence, one that deeply marked the Knox family, and Fitzgerald’s life. Penelope’s brother, Rawle, spent three and a half years as a prisoner of war in a Japanese camp. His family, who had not known if he was dead or alive, first heard from him when the Red Cross arranged for liberated prisoners to send postcards home. According to Lee, Rawle “mailed the Knoxes a crossword clue,” but “no one could work out the answer.” A Knoxian gesture, daring in its high discretion. But another kind of discretion was also Knoxian: “Just before his return, he sent a letter to [his father], saying that if ever he wanted to ask him about what had happened in the camp, Rawle would tell him. He came back, and no one in the family ever asked him anything.” Repeatedly, this superbly intelligent biography falls upon empty archives, archives one wants to believe were shrewdly emptied by Fitzgerald or by her three children (who wants biographers spelunking in family darknesses?), but which one fears, rather, were never full to begin with, because little was ever said, let alone recorded. Penelope’s husband, Desmond Fitzgerald, also suffered through a dreadful war (he was an officer in the Irish Guards and saw heavy fighting in Italy), and returned “a different person from the dashing young officer Penelope had married in 1942.” Desmond “didn’t talk about it,” one of Penelope’s friends said. Trauma is unspeakable. But so is love, apparently. After informing us of her wedding, Lee adds, “There are no clues to Penelope’s feelings or motives—no love letters, no diaries, no reminiscences. Friends, looking back, made their guesses.” And so it goes, through the decades. Fitzgerald, for instance, maintained a strong Christian faith, and was a lifelong churchgoer. But you will find no revealing personal statement, either in this biography or in her writing, about the status of that faith. She preferred not to talk about the most important events in her life, or has left

sparse and evasive records of what she felt. Lee’s book is crossed with wounds; but they cannot speak.

Lee stays close to the evidence, and is wary of speculation. But it’s hard not to see the story of Fitzgerald’s life—at least, until its improbable late renaissance—as painfully symptomatic of its period and nation, a self half-maimed by familial emotional reticence, unhappy boarding schools (Fitzgerald was sent away at the age of eight, and hated her schools), male privilege, the religious self-mortification of leftover Victorian evangelicalism, the devastations of two world wars, and a distinctively English postwar parsimoniousness.

At Oxford, in the mid-nineteen-thirties, Penelope Knox was spotlit for greatness. The Knox name had been celebrated in Oxford for generations, Lee reminds us, and its owner’s brain was formidable (she had won a scholarship, “for the best candidate in her year”). She was in a smart set known as Les Girls. But her mother had died at the age of fifty, only a few months before Penelope arrived at university, and the Knox achievement was, for her, both banner and burden. One of her Oxford friends shrewdly thought that “though she started life so brilliantly and was so well connected, she was not as fortunate as those of us with a more ordinary and supportive background.” Four years after graduating, she married Desmond, with whom she had overlapped at Oxford. During the war, Penelope wrote for *Punch*, and worked for the BBC. Though she wasn’t writing any fiction (she had firmly informed the university newspaper that she intended to “start writing” when she graduated), she was making her way in journalistic and literary London. In the early nineteen-fifties, she and Desmond effectively co-edited *World Review*, an internationally minded cultural journal that sounds like a precursor to *Encounter*. Lee’s pages on the long, serious essays that Fitzgerald wrote for that magazine are a revelation: she wrote on Alberto Moravia, on Jarry’s “Ubu Roi,” on Italian sculpture and Spanish painting.

And then it all fell apart. The journal failed. Desmond, who had trained as a lawyer, seems to have been doing more drinking than lawyering. By 1953, there were three children to look

after—Valpy, a son; and two daughters, Tina and Maria—and not enough income. Penelope had to cut down her clothes to make dungarees for Valpy. In 1957, the Fitzgeralds fled their comfortable rented home in Hampstead to more modest accommodations in Southwold—that “very definite place.” But even then the family was overextending itself. In 1959, as in some hideous English version of *Emma Bovary*’s punishments, auctioneers were called in, and the family’s belongings were put onto the sidewalk. The Fitzgeralds returned to London but could afford to do so, it appears, only by renting that Thames houseboat. The conditions, as reported by Lee, were bleak: frequent power cuts, permanent damp, no oven, scant and basic food. Penelope slept in the living room, on a daybed. (She and Desmond never slept together again.) “For the rest of her life, she would not have a bedroom of her own, but would sleep in a bed that turned into a sofa in a sitting room,” Lee writes. For some time, between 1961 and 1962, Tina and Maria did not go to school.

In “Offshore,” the novel she wrote about the years she lived on the river, Fitzgerald drew a caustic yet tender group portrait of her fellow-houseboaters, watery drifters who “aspired towards the Chelsea shore,” but who sank back, condemned by “a certain failure, distressing to themselves, to be like other people.” Further failure awaited. Desmond, by now alcoholic, was convicted in 1962 of stealing money from his law offices. He was given two years’ probation, and disbarred. He eventually found clerical work in a travel agency, a job he held for the rest of his life. (He died in 1976, at the age of fifty-nine.) Characteristically, the court case “was never discussed” in the family; indeed, Lee tells us, Fitzgerald’s “silence on the subject of Desmond’s failure was almost impenetrable.”

She began teaching in 1960, first at a performing-arts school and later at Westminster Tutors, a “crammer” for those in the last two years of their secondary school. (One of her most appreciative pupils was the future novelist Edward St. Aubyn.) She taught for twenty-six years, until she could afford to give it up. The income was essential but insufficient. In June, 1963, when the



family lost the boat to the river, a phase began that, even by Fitzgerald’s standards, defies explanation. Fitzgerald would not ask for help from her father, who lived comfortably in a large house in Hampstead. Instead the family spent four months in one of the City of London’s homeless shelters, in Hackney. (One room with bunk beds, communal canteen.) Eventually, the Fitzgeralds received public housing, near Clapham Common, where they stayed for eleven years, until the children left home for university.

It is hard not to admire Fitzgerald, who, amid material chaos, impoverishment, a failed marriage, and what seems to be severe depression, held her family together, and became its breadwinner. Some of the strain of this period can be felt in “Offshore,” which centers on a rift between Nenna James and her useless husband, Eddie. Despite winning the Booker Prize, it is one of her weaker novels—in part, because the stakes never quite come into focus, and be-

cause the marital estrangement remains opaque. At one moment, Nenna and Eddie have an enormous argument. Out of nowhere, it seems, Eddie yells at his wife that she is “not a woman!” Thanks to Lee’s biography, I now start to see why I was puzzled. The accusation should have been the other way around (“You are not a man!”), but perhaps Fitzgerald could not bring herself to utter those words.

At the end of her biography, Lee writes about the “gaps and silences” left between the pages of her book. There are many things, she says, that Fitzgerald “did not want anyone to know about her, and which no one will ever know. I find this frustrating, amusing, seductive, and admirable.” Perhaps because Fitzgerald’s children are still alive, and because this biography was written with their blessing, Lee is notably less searching here than she was about one of her former subjects, Virginia Woolf. She tends to judge

Fitzgerald's reticence as the subject's wise avoidance of biographical or journalistic scrutiny. The issue, though, is not what Fitzgerald kept from us—a reasonable right—but what she kept from those closest to her, and from herself. Perhaps because I grew up in an austere evangelical household, full of secrets and omissions, I find the silences, even the stoicism, less appealing than Lee does. Shouldn't stoicism be less admirable when it isn't stoically necessary? Wasn't some of Fitzgerald's behavior a transferred form of evangelical puritanism, the kind of wanton self-harm—itself a parody of Christian mortification—that the atheist Knut Hamsun writes up comically in his novel "Hunger"? And though there was nothing easy about Fitzgerald's form of mortification, her snobbery about money and material possession was in part premised on that most English of possessions: the invisible superiority of her class. Like shabby Dillwyn and Wilfred before her, she seemed down-at-heel until she opened her mouth.

Lee is oddly incurious about the question that must occur to every reader: why did Fitzgerald wait so long to start writing? The obvious answer is that she had three children, a wayward husband, and was earning a living—and yet you feel that, during the nineteen-sixties, had she started also writing, things could hardly have gone worse for the family. (The painter Alice Neel, for instance, lived amid domestic impoverishment in large part *because* she was furiously painting.) Certainly it seems relevant that Fitzgerald started to write after her children were old enough to

leave home and take care of themselves. Was it also significant that she started writing shortly after the death of her father? Did some Knoxian combination of insecurity and confidence hold her back until she could be sure of avoiding public failure? "Decision is torment for anyone with imagination," a character says in "Offshore." "When you decide, you multiply the things you might have done and now never can. If there's even one person who might be hurt by a decision, you should never make it. They tell you, make up your mind or it will be too late, but if it's really too late, we should be grateful." Potential remains potent if unused.

What frustrates the biographer delights and fortifies the reader. The work that Fitzgerald produced between 1977 and 1995 is full of indirection, enigma, sidelong mystery, omissions of all kinds. "The Blue Flower" is one of the strangest and freest books ever written; Fitzgerald seems to be almost making up the form's rules as she proceeds. The novel is historical, set in Germany at the end of the eighteenth century, and narrates the short life of the Romantic poet and philosopher Novalis (whose real name was Friedrich von Hardenberg, and who is known as Fritz). It rests, like most of Fitzgerald's work, on a great deal of research. But the large amount of historical fact is subtly muffled, and the novel floats away from its factual underpinnings; it is as mystical as it is meticulous. (Fitzgerald both mocks and admires Fritz's youthful Romanticism.) The intelligent, high-spirited Hardenberg family—Teutonic Knoxes, really—are brought alive in as-

tonishingly brief, elusive vignettes, fleeting chapters closer to the eloquent insufficiency of poems than to the reflexive garrulousness of fictional prose. Narrative threads seem to be snipped off at obscure junctions; nothing is baldly stated. Yet the form contradictorily holds—dreamy, precise, magical, but always "very definite."

Though Fitzgerald did not risk failure at thirty, she wasn't complete and unassailable at sixty-two, either. You can see her becoming a better writer as she aged—more serious and expansive, more confident and supple. "The Blue Flower" has beauties on every page, but one of the most moving involves the novel's hero and his mother, the Freifrau Auguste. Fritz wants to marry the very unsuitable Sophie von Kühn, and has written to his father to ask for his blessing. Fritz arranges to meet his mother in the garden, in the evening, to discuss his fortunes. He is young and egotistical, and cares only about his love affair. But his mother is thinking of all sorts of painful things, none of which can be expressed:

An extraordinary notion came to the Freifrau Auguste, that she might take advantage of this moment, which in its half-darkness and fragrance seemed to her almost sacred, to talk to her eldest son about herself. All that she had to say could be put quite shortly: she was forty-five, and she did not see how she was going to get through the rest of her life.

But Fritz leans forward, breaks the spell, and insistently demands, "You know that I have only one thing to ask. Has he read my letter?" Reticence is overcome, to no avail. But the wound has spoken, in the novelist's voice. ♦

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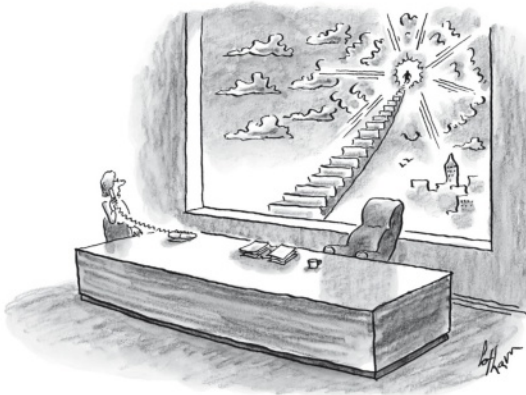
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THE WINNING CAPTION



"Looks like you just missed Him."
Henry Northington, Brooklyn, N.Y.



THE FINALISTS

"Honestly, I'm not sure you're partner material."
David Lee, Flushing, N.Y.

"We'll really miss you."
Malcolm Windham, Austin, Texas

"We're tabling the motion."
Patti Smart, Chicago, Ill.

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